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THE DIAGNOSIS OF THE NORMAL HEART.[1]

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THE importance of recognizing whether a heart is normal or diseased is obvious and is forced upon the practitioner very soon after graduation and at short intervals throughout his career.

The problem may present itself in several ways:

1. Is this heart normal or diseased.

2. If normal, is some disease present which causes symptoms by a toxic action on the heart?

3. If the heart be diseased, is the disease alone sufficient to cause the symptoms or is some further pathological state present?

I propose to devote myself chiefly to the first question and would ask you to consider here the effects likely to be produced if it is answered incorrectly.

First let us suppose that signs or symptoms of heart disease are overlooked or wrongly interpreted and the patient is assured that his heart is sound.

What harm is likely to follow this error?

If the physician is his regular medical attendant and can review the case from time to time, there is little or no danger, for if symptoms arise or continue as a result of some cardiac inadequacy, the patient will return and further consideration will no doubt result in a correct diagnosis.

If no symptoms arise, there is no reason to suppose that any harm is done by such a wrong diagnosis, except perhaps in the case of syphilitic aortitis.

Of course, if the examination is for the services or for insurance, the problem is slightly different, but here the benefit of a real doubt is usually given against the candidate.

If, on the other hand, a cardiac lesion is diagnosed where none is actually present, great and often irreparable harm is done. Such patients are usually young and impressionable and at all ages the lay mind has a great and unreasoning fear of heart disease, so that the unfortunate suggestion is strong and in my experience permanent.

I know several such patients whose symptoms have all gone and whose hearts are obviously normal now even to textbook standards, but who still in their innermost thoughts are afflicted by a dread

[1] Read at a meeting of the Queensland Branch of the British Medical Association on August 27, 1925.

and on the least unpleasant symptom recur to the fancied weakness. Thus it seems to me that the patient should always be given the benefit of the doubt and that every heart should be regarded as normal unless there is clear proof to the contrary.

This, of course, has often been emphasized, very specially by Mackenzie, but weekly, almost daily indeed I see signs that it is neglected. A very great danger has been added by the routine medical inspection of children, where much is argued from signs alone and where the all important history is frequently lacking.

In one such unfortunate case a perfectly healthy girl who had never had a moment's illness, was examined with others at school and a murmur or irregularity was found. She was treated for some time and so profound an impression was produced on her mind that she has not done more than eight months' work a year since, though her heart is normal above suspicion and she has passed many medical examinations during a nursing training. In spite of this she still fears her heart and stops work on the least discomfort.

Such cases could be multiplied, but all I wish is to fix in your minds the tragedy of an undeserved diagnosis of a cardiac lesion.

Let us then examine the criteria usually relied on in examination.

The Apex Beat and Cardiac Dulness.

The apex beat, a purely clinical and not an anatomical point, is stated in the textbooks to have a definite position on the chest wall, but it is only an average and must not be regarded as a fixed point.

Somewhat wide limits of variation are found in health and it is unwise to lay stress on alterations unless they are considerable or unless with an outward shift of the apex beat is combined a firm, powerful thrust.

Here I should like to protest against the pseudo-diagnosis—dilatation of the heart—which is sometimes given to patients. It causes much alarm and seems a terrible thing, but is it? Let us make the large assumption that the diagnosis is correct: what does it indicate? Surely it shows that the heart for some reason is unable to cope with the work which it has to do, without augmenting its powers, therefore it dilates and thus each beat is more powerful.

It is very unlikely that any dilatation which is merely a compensatory one, can be recognized by clinical means, but it is helpful to remember that the cause of dilatation is not necessarily of first importance and that such a condition, unaccompanied by symptoms even on exertion, is incredible, as if the heart were so nearly competent a night's rest, at any rate, would restore it to normal. If it were not competent owing to cardiac damage, this fact would become obvious under the ordinary conditions of active life and the symptoms and signs would make a diagnosis of failure simple without any consideration of heart size.

If there is heart failure with or without dilatation, the obvious treatment is rest till the failure disappears.

Thus, if in a young patient after illness or some acute breakdown signs of failure are present, rest should be continued till they disappear and then steadily increasing exercise.

If the patient be told that this is necessary as a result of general poisoning and not special heart damage, the baneful suggestion will be absent and the physician's task much easier.

As a matter of fact the careful work done on the "soldier's heart" during the war has convinced most physicians who followed it, of the inability of ordinary physical examination to determine heart size. It was shown again and again that hearts whose left border had been regarded by the clinician as further out than normal, were really not enlarged to orthodiagraphy; in fact the average in these conditions was usually found to be smaller than normal.

The same difficulty is found in fixing accurately the right cardiac margin and I think it is wise to regard the definite palpable apex beat as the only safe guide to the size of the heart and to remember that the position of this may vary greatly in health.

Of course, in many cases cardiac enlargement is easily demonstrated, but in many others the signs are indefinite or deceptive.

The accurate differentiation of hypertrophy from dilatation is, of course, impossible during life and often difficult after death. In one class of case, however, that of the rheumatic child, clear evidence of enlargement is usually found in severe heart lesions and is of the utmost value.

The Heart Sounds.

What then of the sounds of the heart?

That the sounds of the heart are not always clear in health has been so steadily preached that I feel it almost an impertinence to emphasize the fact again, but though accepted as a generality, the knowledge is frequently not applied to individual cases. This may perhaps be due to the rather unfortunate stress laid on "functional" murmurs as opposed to "organic."

In itself this is a sound enough division, but it seems to have led to a feeling that there must be some obscure difference in the mode of production and mechanics of the two kinds and also that all "organic" murmurs must be important.

Neither of these ideas is correct.

Observers give different figures as to the frequency of systolic murmurs in the heart sounds of normal children and youths, but probably about 15% to 20% of mitral, 3% to 4% of aortic and up to 90% of pulmonary systolic murmurs are present on the average.

There is also the systolic murmur which is commonly heard in the fourth interspace to the left of the sternum in normal people and which is probably exocardial.

The exact mode of production of these mitral murmurs is still uncertain and in this connexion it

is worth while considering the factors which close the mitral orifice. These are two, the closure of the valves and the contraction of the muscle of the auriculo-ventricular ring. The latter is of great importance in the rheumatic heart, where the early murmurs are probably due to some weakening or loss of efficient contraction in the muscle, as it is obvious to anyone who examines the valves within fourteen days of the onset of rheumatic endocarditis that the small vegetations then present could not affect the efficiency of their closure.

The leak no doubt results from a loss of the proper contraction of the musculature of the ring, perhaps due to the many "rheumatic nodules" present in this part, perhaps merely to the general poisoning. If the mitral leak in the heart of the normal child is due to a muscular inadequacy, it must be only in timing, for such hearts are as efficient as those whose sounds are clear.

In many of these hearts, however, a sinus arrhythmia is very evident and the murmur is heard better during the slow periods; it may be that the valve segments are not brought into contact so completely as is usually the case at the end of auricular systole and therefore there is a leak with the beginning of ventricular systole until the valve segments close firmly.

However such murmurs are caused, the point of importance is that they do not indicate disease and their presence is not even a point in favour of disease.

A systolic murmur at the aortic area alone is no proof of disease and may be disregarded if there is no evidence of aortitis or aortic dilatation, no thrill, no anacrotic pulse and the second sound is clear and ends sharply.

So called accidental murmurs, produced outside the heart, in the pericardium, pleura, lungs or mediastinum, can usually be recognized if their occurrence is remembered.

The character of a murmur and its path of propagation give little really reliable help as to its cause, but diastolic murmurs, if not exocardial, are always pathological.

Cardiac Rhythm.

Again, irregularity is frequently regarded as an abnormality, though this difficulty should have been abolished by the work of Wenckebach and Mackenzie.

It has now been conclusively shown that sinus arrhythmia is commoner than a regular beat in young people and that extra systoles, the next commonest irregularity, are devoid of prognostic significance. These two irregularities and their meaning are or should be recognized by all practitioners today, so that we can pass lightly over them. The differentiation of extra systoles into the unimportant and the serious, made by some writers, appears to be purely academic and rests on no demonstrated basis of fact; the wise practitioner will form his prognosis on the other signs and symptoms, without regard to the extra systoles.

The commonest of the more important arrhythmias, however, auricular fibrillation, merits our attention. This irregularity has now been shown to have its origin in a profound alteration of the method of beat in the auricles. Instead of rhythmic orderly impulses arising at the sinus there is a continuous wave of contraction passing around a ring of muscle in the auricle, usually around the inferior *vena cava* or the two caval orifices. This results in a rapid, irregular beating of the auricles at a rate of four hundred and fifty to six hundred per minute, a rate which the ventricles are quite unable to follow, and the ventricular response is usually at about one hundred and twenty to one hundred and thirty and totally irregular.

This condition occurs in many pathological states, but also there is reason to believe that it may occur in hearts which are quite normal except for a temporary poisoning by some toxin.

We know that in the normal dog's heart stimulation of the sympathetic nerves will not produce auricular fibrillation, though in about one in fifty unselected hearts such a result does follow, but if the heart is poisoned by chloroform, barium or some other suitable poison, such an arrhythmia will frequently result from stimulation of these nerves. This and many clinical cases suggest that the occurrence of auricular fibrillation does not necessarily indicate disease in the affected heart, but may be simply the result of sympathetic stimulation at a time when the heart is poisoned by some toxin and with the passing off of this poisoning the normal beat may return and remain. Such a condition is, of course, abnormal, but the point is that a diagnosis of lasting cardiac disease should not be made in such conditions without a full study of all the factors.

If there is no failure during the attack and the heart appears normal afterwards, the heart muscle is good and a good prognosis may be given, though a careful search for a cause must be instituted.

One of the most frequent and striking of such causes is adenoma of the thyreoid and this should always be looked for. Mere rate of the heart beat may be of value; any rate under forty would give rise to a suspicion of heart block and if persistent under exertion would demand investigation by graphic methods which may be necessary for a complete demonstration.

A rapid rate of beat unless due to some altered method of beating, such as auricular flutter or paroxysmal tachycardia, is in the absence of obvious cardiac damage, most probably an index of a general infection. Of such hidden infections pulmonary tuberculosis is by far the most common.

Few if any damaged hearts are recognizable only by rise of pulse rate and those in which this is the outstanding sign, are usually affected by bacterial endocarditis in which the tachycardia is more an index of septicæmic infection than of actual heart damage.

In a doubtful case the history may be very important. Thus a history of past rheumatism would certainly aid in the interpretation of a cardiac murmur, but it must be remembered that in

many cases of rheumatism complete recovery occurs with no heart damage and also that many attacks of so called rheumatism will be found on careful analysis to be certainly not rheumatic fever.

A history of a small hæmoptysis or of pleurisy would, of course, suggest pulmonary tuberculosis and one of sore throat, nasal discharge and headache the necessity for excluding antral and nasopharyngeal infections. The all important point is the efficiency of the heart and what it can do in response to effort. This entails an inquiry into symptoms. I should like to urge here the immense value of a careful history directed to particular points, without which a useful opinion is often impossible.

Many attempts have been made to find a short cut to this information by means of various exercise tests, but the multiplicity of these makes it obvious that none is quite satisfactory.

The main fallacies are two: (i.) Such tests must fail in the presence of a neurosis, as the patient will either express himself as unable to go on or will produce the symptoms which have been suggested to him as likely to occur; (ii.) if the patient is convalescing from some acute disease, he will naturally show a lowered response to effort, but it can hardly be claimed that the inability of a man who is convalescing from typhoid fever to run upstairs with ease, is due to a true cardiac inadequacy. It is surely due to a combination of muscle and nerve and possibly other organic weaknesses through the general poisoning of the system.

Symptoms of Cardiac Disease.

The symptoms most usually complained of are fainting, fatigue on exertion, cyanosis and palpitation.

Fainting.

Fainting is in the young at least very rarely if ever a cardiac manifestation, but if it occurs in a patient whose heart sounds are accompanied by murmurs or irregularities, it often causes doubt or error.

Lewis showed by direct observation that fainting in some of his cases of the "effort syndrome" was due to a vagal slowing of the whole heart, *plus* a lowering of systolic blood pressure to about fifty or sixty millimetres of mercury. Neither of these would alone cause unconsciousness, but the combination is effective.

Of truly cardiac conditions which would cause unconsciousness, heart block is by far the most common and can usually be readily diagnosed or at least suspected without mechanical aids.

Syncope occurs in some patients with aortic valve disease, but in such circumstances the lesion is nearly always quite obvious.

Syncopal attacks in later life are usually found in people with definite arterial changes and are not likely to cause trouble in diagnosis. In younger people it is important to remember that attacks of unconsciousness may be true epilepsy and this must always be excluded. A careful balancing of the history is usually sufficient for this purpose. Attacks of vertigo due to labyrinthine disease and the like are often mistaken for faints, but are readily recognized by the fact that in them the vertigo persists while the patient lies flat and is increased if the head is moved.

Fatigue on Exertion.

Fatigue on exertion is often ascribed to cardiac states, but should not be so regarded. It is commonly seen in toxic conditions, anæmias or nervous conditions and in true cardiac inadequacy other symptoms appear and are prominent before fatigue is complained of.

Cyanosis.

Cyanosis may, of course, be due to cardiac abnormalities, especially congenital malformations, but it must be remembered that many normal children show this sign in cold weather or after exposure. In these cases it will be found that the blueness disappears on exertion and that it is not accompanied by other signs of distress; it is no doubt due to some stasis in the capillaries of the skin. The lesser grades with cold blue hands are common in cold countries, but less frequently seen here.

Palpitation.

Palpitation is a symptom complained of in many conditions and it is necessary to inquire carefully into what is meant by it.

In some cases it is simply an undue sensibility to the heart beat, as is felt by nervous people, especially under any strain. In others it is a persistent feeling of rapid beating; in others the occasional irregularity or pause in the heart beat or hard thump of the heart after a pause which betrays an extra systole.

When the palpitation is felt as a continuous flutter, a very important line of inquiry is to discover whether its beginning and offset are sudden or gradual, as in most cases of true paroxysmal tachycardia the patient recognizes the suddenness of the offset and appreciates the immediate change from discomfort to complete normality. Where this is definitely recognized, it is certain that the tachycardia is due to the incidence of an abnormal rhythm, even though no attack may be observed by the physician.

An attack of palpitation which lasts for some time and in which the patient recognizes that the heart is beating irregularly with a sensation of fluttering in the chest, is almost certainly due to a paroxysm of auricular flutter or fibrillation.

If the physician is able to see the patient in an attack, diagnosis is usually quite simple and if necessary help may be got by making the patient exert himself a little. If the tachycardia is due to the incidence of a new rhythm, the rate will be unaltered by exertion, while if not, it will probably increase.

The only form of irregularity which persists when the ventricle beats rapidly under exertion, is that due to auricular fibrillation.

Palpitation in the absence of an alteration of cardiac rhythm, may be felt by those whose nervous

system is unduly sensitive, even though the rate is little increased or it may be due to rapid beating induced by nervous shock of some kind.

Palpitation which persists and is increased by slight exertion, is suggestive of a general poisoning from some bodily disease, such as exophthalmic goître or pulmonary tuberculosis.

Pain.

Pain in the chest, especially if combined with other doubtful signs or symptoms, is very liable to give rise to doubt.

There can be little doubt that cardiac pain may be produced even in normal persons if exertion be sufficiently severe and sustained, but in the vast majority other symptoms would show themselves so unpleasantly that exertion would cease before pain became obvious. Since the war a large number of men have had their attention directed to their hearts either by being themselves invalided on account of "D.A.H." or by hearing of the symptoms from their friends, so that symptoms which might have passed unnoticed, are now regarded seriously. As a rule genuine anginal pain can be readily recognized. It rarely occurs except in persons over forty with signs of arterial change or in persons with easily recognizable cardiac lesions or in syphilitic aortitis.

If these can be excluded it is very unlikely that the pain is due to true cardiac disease.

Again, the pain of angina appears almost always during exertion or very shortly after it and not during rest except in cases whose severity is great enough to make diagnosis easy; whereas the pain in the minor cases is usually more evident while the patient is at rest and even in bed, though it may be brought on by exertion.

Where a young nervous person complains of a first attack with all the characters of a severe anginal paroxysm and this attack comes on during rest or at least in a convenient place and passes off in an hour or so, it is certain that it is not true angina. Such attacks are not infrequent in patients with some slight medical knowledge or in those who have had the symptoms of angina suggested to them.

Tenderness over the tissues about the apex beat and front of the chest may be found either in serious states or in the less important "functional" form.

In true angina the pain usually begins about the sternum, while in the lesser states it is more often located about the left breast. Also true *pulsus alternans,* if detected, definitely proves the presence of a serious myocardial state.

It is important to remember that pain and tenderness about the præcordium may be caused by many conditions apart from heart disease, especially abdominal states, pleurisy, fibrositis and arthritis of the left shoulder. I have seen two patients in whom the latter condition caused error in diagnosis.

Dyspnœa.

Dyspnœa on exertion is probably the most important of all symptoms as, at least in the young, it is the first sign of failing cardiac efficiency. This symptom is almost always regarded by the patient as a sign of heart disease, but much care must be taken to exclude other states which may cause it.

Serious pulmonary and renal disease are usually easily recognized and need not detain us, but anæmia may cause much trouble. It is a frequent experience to find that the first symptom that brings the patient with pernicious anæmia to his physician, is dyspnœa on exertion and as systolic murmurs are very common in this disease, mistakes are not infrequently made.

The commonest source of difficulty, however, is in indefinite toxic states, due to poisoning by focal infections, as unsuspected tuberculosis of the lungs, septic tonsils, antral and dental infections, cholecystitis and so forth as well as delayed convalescence from any infection. Such conditions give rise to shortness of breath on exertion, but with this is associated a general feeling of fatigue and lassitude which will usually give the clue as this is emphatically not a cardiac symptom. The importance of such focal infections is often denied, though it is hard to see on what grounds. A septic wound or a tuberculous infection is readily accepted as a cause for poisoning, so it is a little difficult to understand the hesitation in accepting septic tonsils.

The one caution that seems necessary, is to be sure that the focal sepsis does really exist, as much harm has been done by enthusiasts who find such sources of infection in every patient who is out of sorts. My own rule is to seek a specialist's opinion on all such special cases and if he is not satisfied that the suspected organ is really diseased, the search for a cause is renewed.

INDICATIONS FOR INTERFERENCE DURING PREGNANCY.[1]

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Pregnancy cannot in any way be considered a normal physiological process. Most women are disturbed to a greater or lesser degree.

The complications that arise during pregnancy afflicting the mother, child or both in such a manner as to endanger their lives, are many. I do not propose to deal with all of them, but I purpose to bring before you the main complications that will arise at unexpected intervals in your own practice and that demand that something be done in order to avert disaster. It is here that the judgement of the obstetrician is put to the test and I have no hesitation in saying that there are no situations in medicine or surgery that require broader knowledge, sounder reasoning and more courage of purpose than do some of the problems that confront the practitioner in obstetrics.

In the earlier months of pregnancy the complications that arise and demand interference, are those which if left to go on will endanger the life of the mother. In later months the lives of both mother

[1] Being a lecture delivered during the obstetrical course of the Melbourne Permanent Committee for Post-Graduate Work on June 23, 1925.

and child may have to be considered, but here again the life of the mother is of paramount importance.

Contracted Pelvis.

Contracted pelvis must be considered as an indication for interference during pregnancy and at the same time I want to consider it from another aspect, whether there should be any interference before labour commences.

First let me state that the present classification of contracted pelves obtained in the textbooks has always appeared to me to be a particularly cumbersome one. It is hardly ever grasped by the student and is forgotten by the graduate at the earliest possible moment.

There are, however, three varieties of contracted pelves that can be easily remembered; on these we can base our calculations when examining patients. These are: (i.) Generally contracted pelvis (this is not a deformed pelvis in any particular); (ii.) funnel shaped or masculine type of pelvis; (iii.) rhachitic or nutritional type.

To these can be added a fourth group which is the result of conditions usually outside the true pelvis, such as the pelvic deformity caused by tuberculous disease of the hip or caries of the spine.

If we gave more time to a careful physical examination of the patient and a more detailed study of the pelvis, we should not have the frequent disastrous results that occur so often at the end of pregnancy. The causes of these results can only be due to the wrong method of delivery due to the lack of careful and accurate observation and measurement of the mother's pelvis and of the relative size of the fœtus during pregnancy. It is however, satisfactory to know that the difficult emergency obstetric work which was common at our hospital some years back, is now not seen as frequently. This can mean only one thing and that is that more care is taken in making observation by the general practitioner of the patient during her pregnancy. To this might be added the fact that the lay mind is being educated to the importance of the pregnant woman putting herself under the care of her medical attendant early in her pregnancy.

In the majority of cases parturition ends in a normal manner and it is because of this that there is a tendency to overlook the fact that it is frequently abnormal. All possibility of pelvic abnormality should be excluded and this can be done only by considering that the pelvis of every *primipara* may be abnormal. A gross pelvic deformity is not difficult to recognize, but the abnormalities that cause the most trouble and are most frequently overlooked, are of pelves that are generally contracted while the fœtus is of average size.

Measurements of the pelvis should be taken in all cases early in pregnancy, and a note made of the measurements; they should be verified at the seventh month when the size of the fœtal head can be approximately estimated.

The intercristal, interspinous and external conjugate diameters are the important external measurements. These measure respectively 27.3 centimetres, 25.4 centimetres and from 19 to 20.3 centimetres (ten and three-quarter inches, ten inches and from seven and a half to eight inches). The relations between the intercristal and interspinous measurements are important. If they are equally diminished, a general deformity of the pelvis is present. If the interspinous is equal to or greater than the intercristal, there is generally some rhachitic deformity.

If the external conjugate (Baudelocque's diameter) measured from the point below the spine of the last lumbar vertebra to the upper margin of the *symphysis pubis* is less than nineteen centimetres (seven and a half inches), pelvic deformity should always be suspected.

When Should Labour be Induced in a Case of Contracted Pelvis?

In considering the question when labour should be induced in a case of contracted pelvis, it is safe to assert that this should not be done before the thirty-sixth week and then only if the fœtal head can be pushed into the pelvic cavity. It is necessary to give an anæsthetic in order to estimate this accurately. The left hand is used to push the head into the pelvis and with two fingers of the right hand in the vagina and the thumb above the brim of the pelvis, any overlapping can be recognized and the amount estimated. The relative size of the fœtal head and the pelvis can be determined in this manner and, if at the thirty-sixth week it is found that the head can be pushed into the brim and there is no overlapping, the induction of labour by means of bougies can be undertaken. If the head will not enter the pelvis and there is overlapping, Cæsarean section at full term is the only reasonable method of delivery.

The great difficulty is to choose the correct time for inducing labour for contracted pelvis, as it is impossible to determine accurately the size of the fœtal head. The risk to the mother with this operation is very slight, but the fœtal mortality is particularly high. Various figures are given, but according to Whitridge Williams not more than 50% of babies delivered by induction survive the first year. It is also a fact that 70% to 80% of women with contracted pelves deliver themselves if left alone; so that if induction of labour is done at all for contracted pelvis, it can hardly be regarded as a means of saving the child.

Personally I do not induce labour at all in contracted pelvis and get much better fœtal results and less injury to the mother by doing Cæsarean section at term in those in whom there has been no attempt at delivery, but who did not respond to a test of labour. I should prefer to do craniotomy in those in whom the attempt at delivery fails. With Cæsarean section there is much less injury to the mother and the fœtal mortality is between 8% to 10% as compared with the high fœtal mortality of induced labour.

This is a particularly important and large subject and one that cannot be exhausted in a few words. It is the general practitioners who attend the large number of women in childbirth and if they as a

body would become sufficiently interested in their maternity work to make careful and accurate observations of the pelvis of every pregnant women under their care and to realize that this work must be done carefully and methodically with a full appreciation of what each abnormality means, fœtal birth injuries and maternal injuries will be reduced to a minimum.

In the masculine or funnel shaped type of pelvis measurements of the outlet are of considerable importance and very little or any stress is laid on them.

These measurements are not difficult and can be accurately made. The antero-posterior or conjugate from the tip of the coccyx to the lower margin of the symphysis should be 12.7 centimetres (five inches). The transverse measurement, that is, the distance between the tuberosities of the ischii (11.4 centimetres or four and a half inches) is the more important one.

In a funnel pelvis the head may be able to be pushed into the brim, but if the transverse measurement is under 9.5 centimetres (three and three-quarter inches) great difficulty will be experienced in delivery and if the fœtal head is large, delivery may be impossible. Unfortunately this difficulty is not appreciated until attempts at delivery have been made by forceps.

If this type of obstruction be recognized during pregnancy, Cæsarean section is the preferable method of delivery. If not recognized until attempts at delivery have been made, the operation of pubiotomy is here of very great value, as any separation of the pubic bones gives also almost an equal separation of the *tuber ischii* and delivery with forceps then becomes easy. If the surroundings are not suitable for pubiotomy, then lessening the size of the head by perforation and extraction is the only method available.

Nephritic Toxæmia.

Nephritic toxæmia is another complication of pregnancy in which interference is frequently called for and in many cases urgently needed. As its first symptoms are frequently encountered in the later months of pregnancy, it is generally classed with preeclamptic toxæmia until one finds that after delivery albuminuria does not clear up and the diagnosis has to be reconsidered. It usually appears much earlier than preeclamptic toxæmia and is found as early as the third month. There are again some women who repeatedly give birth to premature infants, and who remain well up to a certain point of pregnancy when œdema and albuminuria occur. These undoubtedly have defective kidneys which break down under the strain of pregnancy. The functional recovery of the kidneys in this type of patient is not satisfactory and in severe attacks permanent damage results. In these patients there is a preexisting nephritis complicated by pregnancy rather than nephritis resulting from pregnancy.

Symptoms.

Briefly stated the symptoms are œdema, headaches, gastro-intestinal disturbances, cardio-vascular changes and eye changes. In many cases the diagnosis between this condition and the preeclamptic state is difficult. Symptoms usually appear earlier in nephritic toxæmia. The blood pressure is often high, the arteries are much thickened and there is some cardiac hypertrophy. These vascular changes are not found in preeclampsia and are, therefore, of value in diagnosis. In the severe forms albuminuric retinitis may be present.

When these symptoms of renal insufficiency occur before the child is viable, they are almost invariably due to nephritis and the earlier they appear, the more certain one can be that this is the case. Intrauterine death of the fœtus is very common and the infants born are poorly developed and succumb early during the first year.

Treatment.

There is only one treatment for nephritic toxæmia and that is emptying the uterus without delay. This type of kidney cannot improve under the increasing strain of pregnancy and in addition the poison circulating in the blood stream so interferes with the development of the fœtus as to cause intrauterine death. Many women have given birth to healthy children at the end of pregnancy complicated by chronic nephritis, but the prognosis of both mother and child is definitely bad. In cases of this kind where the presence of the child is urgently desired, even when the albumin in the mother's urine and her blood pressure are increasing, the medical attendant may be persuaded against his own judgement to allow the pregnancy to proceed. This is fraught with very grave danger and if any signs of albuminuric retinitis appear, some permanent damage will remain in the eyesight unless the pregnancy is quickly terminated.

In any case of early pregnancy associated with symptoms of renal changes I would have no hesitation in opening the abdomen, emptying the uterus and sterilizing the patient by operation on the tubes. Here again the mere emptying of the uterus without sterilization is not sufficient as pregnancy is almost sure to occur again in spite of all precautions and it will be found that chronic nephritis is still present.

Some years ago I attended a young woman during several attacks of nephritis. Albuminuria was always present and her blood pressure increased during her periods of good health. She married and saw me when she was three months pregnant. Her renal condition had become very much worse and I urgently advised that the pregnancy be terminated. This, however, was not heeded. Two months later she was again brought to town. She was then quite blind. Her blood pressure was too high to be recorded; her pulse rate was one hundred and sixty. Altogether her condition was hopeless. Her friends now began to realize that something should be done. A vaginal hysterotomy was performed, but she died from uræmia not long after.

Threatened Eclampsia and Eclampsia.

Under the heading of threatened eclampsia and eclampsia we are dealing with probably the most

frequent and most important complication of pregnancy and one for which interference is more frequently called than any other complication. It is a condition that is fraught with the gravest danger unless the signs are recognized and the interference commenced without delay. One of the reasons of its frequency is, no doubt, due to the fact that many medical men are content to see a woman through her confinement, but are not seized with the responsibility of seeing her safely through her pregnancy. Should a proper observation be made by the attending obstetrician and sound judgement adopted when circumstances arise, the percentage of deaths from eclampsia should be negligible.

One American writer goes so far as to say: "Should such a termination of preeclamptic toxæmia ensue, it should be regarded as *prima facie* evidence of ignorance, negligence or bad judgement on the part of the attending obstetrician." Still there are patients with eclampsia who will come under his care for which he cannot be held responsible, such as those seen in consultation, those who do not follow instructions and those who do not seek advice until they are ill.

The signs and symptoms of preeclamptic toxæmia are usually manifest in the last half of pregnancy, but may make their appearance earlier. Unless an obstetrician is prepared to keep in touch with his patient from the time he is engaged and to examine her urine at least every month in the early months and every fortnight during the last three months of pregnancy, he is not doing justice either to the patient or to the child that is to be born into the world.

I shall do no more than mention a few of the early signs and symptoms of toxæmia. They are familiar to all of you. The chief are albuminuria, increased blood pressure, slight œdema, headaches, digestive disturbances. The late symptoms such as albuminuric retinitis, severe œdema, violent epigastric pains, severe headaches and the like I shall mention only to state that you should never allow these symptoms to occur in any patient under your control.

The toxæmia affects the fœtus as well as the mother and any effort to prolong the uterine life of the fœtus for several weeks until it becomes viable is usually of very little avail. If a woman seven months pregnant has signs of preeclamptic toxæmia and this does not clear up after several days' treatment, I consider that the fœtus has a much better chance of development outside the uterus than it would have inside under the influence of a toxic mother. It is much more rational and better obstetrics when the albuminuria is persisting, even if not increasing, when the blood pressure is raised and headache present to terminate the pregnancy than it is to persist in treatment and allow convulsions to occur. Under the former condition the prognosis is good; under the latter it is bad for both mother and child.

In practice a systolic blood pressure above 140 millimetres should be looked upon as suspicious. In most preeclamptic patients we find that the raised blood pressure tends to remain at a constant level. A gradual fall is the best indication of improvement in patient's condition. A steady rise even when the œdema is diminishing, indicates a change for the worse and a sudden rise frequently indicates that convulsions are close at hand. It is therefore of great importance to keep a constant record of the blood pressure until a definite fall has occurred.

Any pregnant woman with albuminuria should be regarded as one who will develope eclampsia unless she is placed under treatment at once. If the amount of albumin is small, regulation of bowels and diet is generally sufficient to effect an improvement. If the amount is large or should increase, putting the patient to bed is of great importance. It is of little value to impose a rigid diet and at the same time allow the patient to get about. Rest is imperative and if at the end of three days on a strict water diet the albumin is the same or increasing, only one method of treatment remains and that should be adopted irrespective of the period of pregnancy and whether the child is viable or not.

Induction of Labour.

The method alluded to is induction of labour. It is the one means of averting the onset of fits if the above treatment should fail. Even when the child is not viable, there should be no hesitation in inducing labour if the symptoms do not show any signs of abating.

Methods of Induction.

Perforation of the membranes is the simplest method, but it is uncertain and is only applicable in cases of hydramnios and marginal *placenta prævia.*

Krause's method is that usually adopted and provided there is no great haste, it is successful in practically all cases. By this method bougies (blunt pointed) are introduced between the membranes and the uterine wall. The patient is placed in the Sims position and careful disinfection of the external genitalia and vagina must be carried out. A speculum is passed and the anterior lip of cervix seized with sponge holding forceps.

In *primiparæ* some dilatation of cervix may be necessary, but in *multiparæ* this is seldom required, Hegar's dilators are used. When one finger can be introduced through the internal *os uteri,* the membranes are separated as far as the finger can reach in a circular movement. This manœuvre is important in helping the onset of pains. It allows some slight bulging of membranes through the internal *os uteri* which has a stimulating effect in causing uterine contractions. The bougies are then easily introduced, the tip being guided with the index finger of the free hand between the membrane and uterine wall. Two or three bougies can be inserted in this way. It is immaterial whether they be side by side or in different directions. It is generally easiest to insert the bougies on the patient's right side. To avoid rupturing the membranes it is essential that all movements are as gentle as possible. Should any bleeding result from penetration of the placental tissue, the bougie

can be withdrawn and inserted in a different direction. Any part projecting outside the cervix should be cut off with a long pair of scissors. It is usually advisable to pack the vagina lightly with gauze wrung out of some antiseptic lotion which is left in for twenty-four hours. Repacking in *primiparæ* is difficult and not necessary. Gauze is more easily extracted than pledgets of cotton wool.

Pains frequently commence in twenty-four hours, but unfortunately in some patients five or six days may elapse. No harm results by leaving bougies in for this time. If there is any delay after forty-eight hours, castor oil and quinine can be given to help the pains to commence. This method I use only in patients whose pregnancy has reached the seventh month. Between the fourth and seventh months vaginal hysterotomy is the method of choice. The more I use this method, the more satisfied I am that it is the safest and quickest method of emptying the uterus. It can be finished at the time and after the anæsthesia is over, the patient has not the apprehension of waiting for further pains and perhaps further anæsthesia. It should however, only be undertaken in a properly equipped hospital and a good assistant is essential. The convalescence is particularly free from trouble and the mortality should be nil.

By the use of Champetier de Ribes's bag satisfactory results can be obtained. The drawback to this is that it is usually necessary to administer an anæsthetic twice and that two bags of different sizes have to be used unless sufficient dilatation is present to admit the larger bag. Where a long cervix is present as in *primiparæ*, this procedure becomes very difficult and in many cases impossible.

Packing the cervical canal with sterile gauze, if there is some dilatation, is another method, but owing to the risk of infection being more possible with this method, it is seldom employed.

When the bag can be introduced, within a few hours, contractions occur. These increase in intensity and become very frequent. The cervix dilates and expels the bag into the vagina. Dilatation of the cervix can be assisted by attaching a weight to the end of the tube and allowing it to hang over the foot of the bed.

I must mention eclampsia (that is when convulsions have actually occurred) as an indication for interference during pregnancy. The opinions regarding the advisability of Cæsarean section in the treatment of eclampsia are very divided, but at present it cannot be excluded as a means of treatment. In the fulminating cases when after the first fit the patient is comatose and jaundiced and has general œdema, it gives the best chance of a favourable termination. Under no circumstances should it be done as a last resort when the patient no longer reacts to other forms of treatment, for her general condition is usually by this time so bad that the chances of recovery are small. The operation is then blamed for an unfavourable termination, whereas it was due to bad judgement on the part of the attending obstetrician. The after results of the operation are improved by a high washing out of the bowels prior to operation and also by lavage of the stomach and retention of some aperient.

Hæmorrhages.

Hæmorrhage during pregnancy is a most important sign and one that frequently calls for interference on the part of the obstetrician. This subject will be more fully dealt with at a later lecture and I will mention only briefly the different forms of hæmorrhage for the reason that it is an important indication for interference.

Threatened Abortion.

In threatened abortion if the uterus is retroverted, it should be replaced and supported by a pessary.

Incomplete Abortion.

It is better to empty the uterus at once in incomplete abortion as bleeding may become very severe, if a portion of the decidua is caught at internal *os uteri*.

Missed Abortion.

When missed abortion is diagnosed the uterus should be emptied. This is best done by the method of using Hegar's dilators until one finger can be introduced into the uterus and the contents removed, the free hand controlling the fundus. The walls of the uterus are then lightly scraped with a blunt curette and pituitary extract is given. Douching the uterine cavity and packing with gauze is not necessary. In some cases it is impossible to dilate sufficiently to admit one finger without the risk of rupturing the cervix. In these cases the fœtus can be extracted with forceps and then the uterine cavity is scraped with a curette. There is often very free bleeding during this procedure. The bleeding ceases when the cavity is clean.

This method can be used up to the twelfth week and if possible it is always advisable to wait until the uterus expels at any rate portion of its contents.

Induction of Abortion.

The operation of induction of abortion is one of the most difficult and dangerous in obstetrics. Up to the third month the uterus can usually be emptied at one sitting by dilatation and cleaning out. From the twelfth week onward this becomes increasingly more difficult and more serious and it should not be attempted by this method.

Perforating the uterus by the curette is sometimes very easy. The ovum forceps also become dangerous and perforation can easily occur. The removal of the fœtus piecemeal through a long cervical canal becomes a matter of great difficulty and if the body has been torn off the head, the latter can resist all attempts at removal.

It is on account of these difficulties that the method of vaginal hysterotomy is of value. It simplifies the procedure and the contents of the uterus can be manually removed and the dangers attendant on the other method are entirely eliminated. In the method of curetting the uterus it is impossible to be sure when the cavity is emptied and there is very grave risk of some decidual tissue being left behind, which, if no infection occurs as a result of its presence, will certainly cause very severe hæmorrhages two or three weeks later.

Septic Abortion.

Occasionally cases of very acute infection do occur in patients who are having a miscarriage or have quite recently expelled a part or whole of the ovum. The intensity of the infection varies in different cases, but the patient's condition must always be regarded as very grave. All the symptoms of a puerperal septicæmia are present with temperature of 40° C. (104° F.) or higher. Frequent rigors are present and the pulse rate is increased to one hundred and forty per minute.

In nearly all these cases there has been some intrauterine interference. Usually the condition is the result of induction of criminal abortion. The organism is a streptococccus and the patient's life is in very great danger. Should there be any interference in these cases or should the infected material be left as it is? There are decidedly different opinions as to the right course to adopt. Personally I prefer to leave things alone as any intrauterine manipulation, no matter how gently done, will open up fresh channels for the absorption of toxins. If the curette is used, the leucocytic barrier that is formed in the wall of the uterus, is broken down and infected thrombi in the veins can be easily disturbed and dislodged. This operation can easily cause the patient's death.

Carneous Mole.

The same treatment is necessary for carneous mole as is indicated for missed abortion.

Hydatidiform Mole.

Hydatidiform mole must be mentioned as an important complication necessitating active treatment.

Diagnosis.

This condition should always be suspected when hæmorrhage occurs in a patient whose uterus is larger than it should be for the period of pregnancy. Once hydatidiform mole is diagnosed, the uterus should be emptied as soon as possible. This operation is not without considerable danger and personally there is no operation I dread more than the attempt to clear out a hydatidiform mole in a uterus the size of a six months' pregnancy. Some dilatation is necessary either by packing with gauze or Hegar's dilators. The fingers cannot be inserted far enough into the uterine cavity to be of much assistance in removing the growth. Sponge holding forceps extract small amounts at a time; hæmorrhage becomes most severe at a very early stage and calls for more hurried manipulations with the possible perforation of the already thinned out uterine wall. I have seen the uterus tightly packed and the operation abandoned for the time being to prevent a fatal termination on the table.

In cases of hydatidiform mole occurring in women who have had children and if the uterus is larger than a four month pregnancy, the safest treatment for the patient is hysterectomy. This also applies to primiparous women, but here the uterus is sacrificed before any children are born.

The treatment usually adopted of emptying the uterus in case of hydatidiform mole I consider far from satisfactory and extremely dangerous to the patient. I hold that much better results would be obtained by opening the abdomen, delivering the uterus and emptying the same by section. In this method there is much less risk from hæmorrhage and should it occur, one is better able to deal efficiently with it.

Induction of Miscarriage.

Miscarriage can be induced after the twelfth week up to the thirtieth week. Here, as mentioned before, the method of choice if the surroundings are suitable is vaginal hysterotomy. If other methods are used, no attempt should be made to empty the uterus after the twelfth week unless the dilatation is sufficient to admit two fingers. In these circumstances the fœtus can be removed easily, but considerable difficulty is experienced with the placenta and excessive bleeding may result. Plugging the cervix and vagina can be used as a preliminary to dilatation, but this method is frequently slow and ineffective. Repeated injections of pituitary extract have been found of service in stimulating the uterus to contract, but unless the uterus has reached full term, it frequently fails.

Accidental Hæmorrhage.

Any hæmorrhage during the later months of pregnancy means that there is some separation of the placenta from the uterine wall and the condition to which the term accidental hæmorrhage is given, is a particularly dangerous and serious complication. The placenta may be completely or only partly detached from the uterine wall and the effused blood may be entirely retained within the uterine cavity (concealed hæmorrhage) or may escape externally through the vagina (external accidental hæmorrhage).

In the external variety there may be some difficulty in diagnosing this from a placenta situated in the lower uterine segment, which leads to bleeding. Examination of the urine should be made and if albumin is present, it is a help in diagnosing the accidental type, as albumin is found to be present in the majority of these cases. Toxæmia predisposes to this type of hæmorrhage.

You will also find that the uterus, if it contains any blood clot, is tender on abdominal palpation. This is also helpful in your diagnosis.

In the concealed variety the diagnosis is comparatively easy. Here the onset of acute pain is sudden. The uterus is enlarged, tense and hard. Tenderness on palpation is severe and frequently the fœtal parts cannot be recognized. The severe pain is a constant symptom together with tenseness of the uterus. This pain must not be confused with labour pains; if the latter are present, the treatment may be different. The uterine muscle in these patients is unhealthy and the most noticeable factor in the management of the condition is that the muscle is particularly unresponsive to any stimulation.

The concealed variety of accidental hæmorrhage is one of the most serious complications of pregnancy and always requires immediate interference. This means that the placenta, except its marginal portion, has become detached and there is an effusion of blood behind. The onset is usually acute

and once the diagnosis is made, the treatment must follow quickly. If you have a clear picture of the state of the uterus that has been the source of a concealed hæmorrhage, it will help you considerably in judging the right treatment to be adopted. It is a particularly damaging injury and on account of the increased uterine pressure the blood ploughs through the fibres of the uterine muscles and completely dissociates them. One or both broad ligaments are involved and are engorged with blood. Such a uterus is quite incapable of retracting and contracting and if emptied *per vaginam*, the patient invariably dies from *post partum* hæmorrhage.

The only treatment to be adopted in these cases that can give any hope of successful issue to the patient, is Cæsarean hysterectomy. Prompt action is necessary also in the external variety of accidental hæmorrhage if the patient shows signs of serious disturbance and the uterus should be emptied without delay by the abdominal method. The child is not considered in these cases as the mortality reaches 90%. In a young *primipara* some time should be given to ascertain whether the uterus will contract; this can be encouraged by the injection of some pituitary extract into the uterine muscle. If after ten minutes have elapsed there is no sign of hardening, the uterus should be removed. This is a particularly drastic result, but you must remember that you are dealing with a particularly serious complication and that it is the only safe method of saving the patient's life.

In my opinion the same treatment should be adopted even if labour is already in progress, as no one can tell to what extent the uterine muscle is disorganized by the hæmorrhage. It is the only way in which *post partum* hæmorrhage can be prevented in these cases.

I have now done Cæsarean hysterectomy in ten patients for concealed accidental hæmorrhage without a maternal death.

If this method is not adopted, rupture of the membranes may excite uterine pains in slight degrees of hæmorrhage, but it is unreliable. If there is any dilatation of the *os uteri*, vaginal plugging carried out in a thorough fashion will assist in furthering this dilatation. The vagina must be thoroughly plugged with pledgets of cotton wool and after six or eight hours the plugging is removed and uterus emptied either by forceps or version, but before this is done, uterine pains must be present.

Placenta Prævia.

I shall not deal at all fully with the complication of *placenta prævia*, but just to mention it as being a very important indication for interference during pregnancy.

Placenta prævia is one of the most common causes of *ante partum* hæmorrhage and usually appears after the seventh month. I have seen it much earlier in pregnancy and have also found it in dealing with abortions.

The treatment of these cases depends on the condition of the patient, the amount of dilatation of the *os uteri* and the situation of the placenta.

When the *os uteri* and cervix are rigid and the placenta situated centrally, Cæsarean section must be considered and is usually the ideal method of treatment. By this method the bleeding is completely under control and there is no tearing or laceration of the cervix which predisposes so much to subsequent infective processes.

Where the *os uteri* is sufficiently patulous for two fingers to be introduced through it and the placenta is not central Cæsarean section should not be considered, but the membranes should be ruptured, bipolar version preformed, a foot brought down and the breech used to compress the bleeding site. If oozing still continues, gentle pulling on the foot will frequently control it.

The delivery should then be left to Nature. Any haste at this juncture is serious to the patient and will result in deep cervical tears and difficulty in delivering the after coming head. Such tearing causes further hæmorrhage and adds to the possibility of infection. Champetier de Ribes's bag is an excellent help for effecting dilatation in these cases of low implantation of the placenta. After the bag is expelled, version is performed and the child delivered.

In private practice, however, better results will be obtained by performing version. This needs only the one manipulation. By using the bag the interference is increased and the morbidity must also be.

Packing the cervix and vagina in these cases is not a satisfactory method. It obscures the bleeding and gives one a false sense of security and particularly adds to the risk of infection.

Hyperemesis Gravidarum.

The majority of women during pregnancy have some gastric disturbance usually amounting to nausea in the morning. In many instances this nausea becomes sufficiently pronounced to cause vomiting. Not all women seek relief for this as they regard it as a necessary affliction of their condition and have the knowledge that it usually ceases when the third month passes. Many of them can be relieved of this nausea by a careful regulation of their life and their food. If constipation is present and persistent, it is important to correct it. If the vomiting persists after attention has been paid to general functions, the condition becomes abnormal and further examination should be made. It is always necessary in these circumstances to make a pelvic examination, as the presence of a retroverted gravid uterus is a frequent cause of excessive vomiting. On correcting this the vomiting is frequently relieved to a considerable degree, if not completely cured.

Sometimes vomiting is troublesome for the first three or four months without any cause being discovered and then improvement continues.

There is another type of vomiting for which no ascribable cause can be found. In this the vomiting is so constant and the dehydration of the tissues so considerable that it is usually spoken of as "pernicious vomiting of pregnancy." The condition is in reality an extreme example of neurotic vomit-

ing and it is not due to toxæmia. Urinary examination in these patients reveals the presence of acetone and diacetic acid. These products owe their presence in the urine to the fact that carbohydrates are being very little utilized. Excellent results are obtained by giving carbohydrates, particularly in the form of glucose intravenously, *per rectum* with sodium bicarbonate or by mouth if it can be retained.

The methods of treatment of this type of vomiting are numerous and I do not intend to enumerate them, but the fact that this condition has responded to a large variety of drugs is sufficient to stamp it as neurotic in origin rather than toxæmic. Suggestive treatment is also of very great value.

When, however, vomiting occurs in association with albuminuria, this means that there is a severe type of toxæmia present and in this particular type of vomiting it is always advisable on account of the rapidity with which the symptoms become worse, to adopt the attitude that unless some improvement occurs within forty-eight hours, the uterus should be emptied without further delay. Especially is this the case if the vomiting contains "coffee grounds" or is bile stained.

The difficulty is to decide which type of vomiting is affecting the patient; the weight of the diagnosis should rest on the examination of the urine. On account of the fact that for some unknown reason some of the patients with severe vomiting suddenly become improved, it is the custom to postpone any severe treatment in the hope that this improvement will occur, with the result that the patient's condition becomes worse and the termination of the pregnancy is delayed until it is too late to be of any value.

The important point to remember is a complete urinary examination; if the albumin and casts are present, it is safer not to delay but to empty the uterus at once.

Though the temperature and pulse rate do rise in some cases, they are not an indication of the severity of the condition. One of my patients in whom the hyperemesis started as an acute condition, in the course of a few days rapidly became worse and vomited "coffee ground" material. Within a week she became comatose and died. The temperature and pulse rate had not changed. Fortunately this type of case is rare.

The prognosis of true *hyperemesis gravidarum* is always grave. As necrosis of the liver cells always proceeds rapidly and as there is no means of determining to what extent this has progressed, it is infinitely better to interfere early when albumin and casts are first found rather than to wait until the patient is *in extremis*. Then, no matter what treatment is adopted, a fatal result is the outcome.

Acute Yellow Atrophy of the Liver.

Acute yellow atrophy of the liver is an indication to terminate pregnancy rapidly; the sooner the uterus is emptied, the better is the prospect of success. This is fortunately a rare complication of pregnancy, but as I have had four cases in private practice and several in hospital practice, for this reason alone, apart from the gravity of the condition when it does occur, I am bringing it before your notice.

In all cases the onset was sudden with intense headache, vomiting and severe epigastric pain. The vomiting was blood stained and the urine contained albumin, casts and frequently blood. Jaundice was present from a slight discoloration of the conjunctivæ to a more pronounced general discoloration.

Examination of the liver in the early stage often reveals enlargement. This rapidly shrinks and its decrease can be followed by palpation.

Let me illustrate briefly a case I have recently attended. A woman, seven months pregnant, had up to this time manifested no signs of any toxæmia. Suddenly she felt ill, vomited and complained of severe epigastric pain. Examination of urine revealed the presence of albumin, blood and bile pigment. She quickly became intensely jaundiced. On abdominal examination the edge of the liver could be felt on the fundus of the pregnant uterus. We know that necrosis of the liver cells rapidly progresses and unless the uterus is emptied immediately, the chances of survival are absent, the prognosis becomes graver the longer the operation is postponed, until in the course of a few days the patient becomes comatose and dies. Here the uterus was emptied by vaginal hysterotomy and much benefit was derived in giving patient plenty of fluid and glucose. This can be given intravenously or *per rectum*.

The glucose is necessary because the damaged liver cannot keep the blood supplied with sugar. As the patient improves, the diet can be gradually increased.

Under the above treatment the patient gradually improved and left hospital at end of three weeks with a slight trace of jaundice persisting.

Hydramnios.

There are minor degrees of hydramnios which do not call for any interference before labour commences. The chief effect of these is to cause discomfort during pregnancy and delay in first stage of labour.

In most cases the increase in the amount of fluid is gradual, but in several of my patients the increase in the amount of fluid and the increase in the size of the uterus has been so sudden as to threaten seriously the life of the patient.

Undue pressure is exerted by the overdistended uterus on the adjacent organs. This occurs particularly in connexion with respiration; severe dyspnœa and cyanosis and inability to breathe except in upright position are the results.

Treatment.

If the abdomen is greatly distended and the breathing is interfered with, termination of pregnancy is urgently indicated irrespective of the period to which it has advanced. It is indicated in these cases as the child is so poorly developed that its chances of survival are very small.

Symptoms can be relieved by perforating the membranes through the cervix and allowing the

fluid to drain off very slowly. Labour pains follow in due course. A careful watch must be made of the uterus as it will probably have lost a considerable amount of its tonicity and *post partum* hæmorrhage may result.

I remember some years ago a patient being admitted to the Women's Hospital with acute hydramnios. Her period of amenorrhœa was five months. Within seven days the uterus reached to the xiphi-sternum. She was desperately ill on admission with cyanosis, dyspnœa and an uncountable pulse rate. On account of the extreme gravity of her condition it was decided to open the abdomen. The uterus was removed *in toto*. It was discovered on examination after removal that a twin pregnancy was present and that the uterine wall was thinned out to a condition resembling its serous coat. The patient made a good recovery.

Pyelitis.

Pyelitis usually appears after the fourth month of pregnancy, when patient has some vesical irritation and also pain usually in right renal region. Urinary examination reveals the presence of pus cells and bacteria. This condition results from compression of the ureter at the brim of the pelvis by the pregnant uterus and the urine becomes dammed back. To this is added an infective process probably as an extension upwards from the bladder or through the blood and lymphatics from the intestines.

The treatment found most beneficial is to see that the patient drinks large quantities of water measured by the gallon. The only drug treatment of any avail has been citrate of potash in large doses up to four grammes given three or four times daily.

From a catheter specimen of urine a vaccine could be prepared, but the employment of this and also urinary antiseptics have not been of much value in my cases.

If improvement under this treatment does not take place, the temperature may continue its high remissions and the condition of the patient soon becomes alarming. The pregnancy should be terminated without hesitation as the emptying of the uterus removes the ureteral obstruction, free drainage occurs to the bladder and in a few days there is complete recovery.

If this treatment is not adopted, pyelo-nephritis results, necessitating removal of the kidney even after the uterus is emptied.

Twenty-four months ago a patient, four and a half months pregnant, developed pyelitis with acute onset ushered in with rigors and high temperature. She did not respond to any treatment including an autogenous vaccine. She was a *primipara* and was particularly desirous of having a child. For nine weeks she was kept in bed under various treatment, but as at this time her general condition was becoming worse, a vaginal hysterotomy was done and the pregnancy was terminated. In four days her temperature was normal and the patient was about in a fortnight. Only recently she was delivered of twins and showed no signs of recurrence of the pyelitis, but at eight and a half months signs of toxæmia developed and she came into labour.

Pulmonary Tuberculosis.

Pulmonary tuberculosis as a complication of pregnancy or rather pregnancy as a complication of pulmonary tuberculosis, is not infrequent. It is generally surrounded with considerable difficulty.

I have seen some patients rapidly become worse, while in others very little alteration was noticed and in a few there appeared to be some improvement.

I feel sure that it is in the early stages of pulmonary tuberculosis that pregnancy produces its worst effect. The patient stands the early months of pregnancy well, but from the seventh month onwards the disease usually progresses rapidly and there is great wasting, increased cough and persistent fever. After the child is born, there is a rapid extension of the disease.

When the disease has been arrested and pregnancy occurs, the majority of the patients with careful supervision pass through their pregnancy and puerperium without any evident changes. In a few the disease may again become active, but subsides later under treatment.

Pregnancy should therefore be terminated in the early stages of pulmonary tuberculosis; but in those in whom the disease has been arrested and no active signs are detected, it should be allowed to go to term.

The method adopted to terminate pregnancy in tuberculous patients is important. Merely to induce abortion and to clean out the uterus by curettage is sufficient only for the time, as a number of these patients will return pregnant a second time.

If it is clear that pregnancy should be terminated and that it would be unwise on account of the patient's condition for her to have any further children, there should be no hesitation in opening the abdomen, emptying the uterus and at the same time sterilizing the patient by excising a small portion of each tube. A supravaginal hysterectomy could be done. This is easier to do, safer for the future outlook of the patient and the convalescence is freer from disturbance than that associated with induction.

Heart Disease.

In itself heart disease is not a definite indication for the termination of pregnancy. Many women with valvular lesions have their children with very little trouble. It is only when compensation becomes disturbed and there are signs of cardiac dilatation that the aspect of the case takes on a more serious nature. When this is present, it is much more important to treat this complication rather than add further strain by the induction of labour. Induced labour is a more serious trial than labour at term. More interference is necessary; generally there is some delay before the pains commence, anæsthesia may have to be induced several times and added to this there is the strain of the expulsive pains.

If compensation cannot be reestablished or œdema of legs and lungs is present with dyspnœa, Cæsarean section is clearly indicated and there should be no hesitation in advising this course. Vaginal hysterotomy may be performed up to the seventh month and abdominal section later. By these methods there is much less disturbance to the patient and her chances of recovery during the puerperium are improved.

Prolongation of Pregnancy.

Another important point to bear in mind is the possibility of the pregnancy being prolonged. If unduly prolonged this may result in the development of a child of much larger size than can be comfortably accommodated by the pelvis.

The approximate date of the confinement should be estimated and the obstetrician should note these dates. Any patient who does not come into labour within the week after her approximate date, should be visited and examined and a careful observation should be made of the relation of the head to the pelvis and an estimate should be made of the size of the child. If the child appears to have reached its full size, labour should be induced if no response is made to quinine stimulation.

If this method is followed, I am sure that the babies are born healthier, with less difficulty and consequently less possibility of birth injury and the maternal tissues are not liable to so much damage.

Uterine Fibroids.

Other uterine conditions will be found in relation to the pregnant uterus necessitating some interference without actual termination of pregnancy.

I have recently operated on three patients for fibroids complicating pregnancy. In each case the patient was admitted to hospital suffering acute pelvic pain and in each case there was some hæmorrhage. A large tender tumour was felt in Douglas's pouch and there was an irregular nodular condition of the uterine wall.

One patient six months pregnant had four large fibroids removed from the uterine wall and the membranes were seen through one incision. This patient was confined at full time without trouble and without any *post partum* hæmorrhage.

In one of the other two patients twelve fibroids were removed and in the third seven. Each left the hospital three weeks later taking their fœtus with them.

Retrodisplacement of the Uterus.

Another condition frequently found during the early months of pregnancy is retrodisplacement. If all pregnant women could be examined during the first two months this displacement would be found more frequently. It is a very frequent cause of early abortion and it is at this particular time that examination reveals the condition.

If found early it is most necessary to replace the uterus, preferably under anæsthesia and to insert a ring pessary which will hold the uterus in position until the fourth month is reached when the ring can be taken out.

Should adhesions be present preventing replacement, this is not an indication that the uterus should be emptied. It is much better treatment to open the abdomen, to free the adhesions, to replace the uterus and to shorten the ligaments. I have done this on several occasions with no interference to the course of pregnancy.

If the patient is situated where abdominal operation cannot be performed, it is then necessary that the uterus should be emptied. The retrofixed uterus, however, is still left and unless operated on later a repetition of the same trouble will occur.

Reviews.

PSYCHOTHERAPY AND NEUROSES.

By his book "The Common Neuroses: Their Treatment by Psycho-Therapy" Dr. T. A. Ross has given us the results of many years' practice in an admittedly difficult section of medicine.[1] It is written in simple language and will be read with both interest and profit both by specialists in psychiatry and general practitioners. Surgeons also might be added to this list, for the neuropath is ubiquitous in his choice of consulting rooms.

Amidst the mazes of psychological theory he shows considerable balance, discussing the various schools without undue bias, though that of Déjerine comes in for most favourable comment, advocating as it does the great utility of persuasion and reeducation. In his comments on the Freudian analysis Dr. Ross makes the following remarks which are worth repetition. ". . . It will quite surely knock down many struts by which a shaky building has been supported . . . and unless they can be replaced by something better the result may be disastrous . . . It is incumbent on everyone who undertakes a Freudian analysis to realize that he is about to perform an operation of a severe and terrible kind, that there is no anæsthetic which can be used and that if it is unskilfully done the damage he may inflict may be beyond repair." Nevertheless in certain rare cases he advocates an analysis on these lines. He believes that in "a judicious selection from many methods will the key to the successful treatment of functional nervous disorders be found." According to Dr. Ross the fundamental bases upon which psychopathology rests, are the conditioned reflex, the emotional reaction and unconscious mental processes. The neurotic reacts to difficulties in one of three ways: (i.) Over-reaction, for example, in neurasthenia; (ii.) under-reaction, for example, in hysteria; (iii.) pretending that the difficulty is not present, for example, in compulsion neurosis. His classification is simple and the theme admirably worked out. The author realizes the importance of the manic-depressive and deals at length with the differential diagnosis of his condition.

The book falls naturally into three divisions, which concern the detailed treatment of the conditions above mentioned. The case histories used to illustrate the text are those of patients who came under the notice of the author in his own work. He emphasizes the supreme importance of a careful physical examination and the making of as complete a history as is possible. Patience and thoroughness are the keynotes. The book abounds in practical hints.

Dr. Ross is careful to point out that he is not the originator of his methods, but he has certainly elaborated their technique. A perusal of the pages devoted to their description may prove a useful antidote to those who consider psychotherapy an easily trodden bypath of medicine.

[1] "The Common Neuroses: Their Treatment by Psychotherapy," by T. A. Ross, M.D., F.R.C.P.E.; 1923. London: Edward Arnold & Company; Sydney: Angus & Robertson Ltd. Demy 8vo., pp. xi. + 256. Price: 12s. 6d. net.

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Modern Views of Hygiene.

When a ponderous object lies motionless at the summit of a hill, it may require an immense amount of force to shift it from its situation. That force represents a colossal effort. But once the impetus has been applied in the right direction, the stationary mass will tend to move downhill, at first slowly and later with an increasing velocity until it crashes through all obstacles without any added energy to help it on its way. Public opinion may be regarded as an inert mass of great weight. If a reform is needed, a stupendous amount of energy has to be exercised to move public opinion even over the smallest measurable distance. If the energy be continued, the velocity will be increased until at last the reformers will be powerless to arrest the movement of the once inert mass. Long after the originators of the reform have directed their efforts to influence public opinion, the demand for all the expedients that formed the programme, becomes more and more clâmant. No power on earth can stop the trend of public opinion at this stage, until what is analogous to the bottom of the hill has been reached. It often happens that there is a thud at this juncture and the mass again becomes inert.

For years there has been a demand on the part of a handful of hygienists that what is usually termed public health administration should be completely changed. The hopeless conception of attacking disease and impaired national health by sending an inspector to examine and report on the pattern of house drain pipes and to burn a little sulphur or volatilize some formaldehyde after the outbreak of an infective disease has become discredited. It has been recognized that the control of the public health implies something much more logical than the administration of a few antiquated and high complex legislative measures. Little by little the hygienists have exerted themselves to awaken the hygienic conscience of the medical profession and of the public. The effort has been colossal and the ponderous mass of unconcern has resisted it for very long. At last the mass has been shifted, at first but a tiny way. A few principles have been enunciated and later accepted. The medical profession is now convinced by irrefutable evidence that in the overwhelming majority of instances infection is passed on from person to person; that many diseases can be prevented by general measures applied to the community as a whole as well as to individuals; that the conquest of infective disease must come from either an attack on the cause or a stimulation of immunity. Proper sanitary environment, the insurance of an adequate and pure water supply, the prescription of efficient lighting, ventilation and heat regulation, the avoidance of overcrowding and the prohibition of unpleasant odours are essential factors in all campaigns against disease, but they are merely secondary measures. The hygienic velocity, if we may be permitted to employ such a term, was extremely slow, but it was just measurable when this stage was reached. It was one thing to force the medical profession to recognize the personal factor; it was quite another to impel the members of that profession to recognize that preventive medicine in its true sense can only be applied by the doctors who are in intimate contact with the individuals forming the community. In the past the public health administrator chased elusive or chimerical agents in the causation of disease. Today the admittedly correct course is to seek the actual source of infection and to measure the degree of susceptibility of all individuals within the range of the infecting agent. It has become obvious that this task is impossible unless the general practitioner is pressed into the service. The increasing weight of professional opinion gradually made itself felt and the velocity increased. The public is now becoming aware that the reform is urgently needed. Public opinion, our inert mass of great weight, is still moving at a slow pace. But the pace is an inincreasing one. The incline is steep and in consequence the acceleration will be progressive. Before the medical profession is swept off its feet by an insistent, perhaps not highly discriminating demand of public opinion, it must take up the running, must

exert all its force to insure the proper direction and assist in giving the mass the final impetus. In other words, the general medical practitioner must prepare himself now to take on his shoulders the greater part of the burden in the attack on disease.

Current Comment.

CARDIAC ENERGY.

THE efficiency of the heart depends on the amount of work of which its muscle is capable. A healthy heart possesses a large reserve of muscular energy, for the peripheral resistance to the circulating blood varies within wide limits. Provided that the neuro-muscular mechanism is properly adjusted, the energy exercised in the maintenance of the circulation is but a fraction of the maximum effort of the cardiac muscle. Nature always works economically, but is apparently extravagant in regard to her reserve forces. The peripheral resistance is lessened by numerous factors, such as the variations of the intraabdominal and intrathoracic pressure. In order that the circulation may be maintained to the greatest advantage, the amount of blood pumped into the arteries at each beat of the heart is kept at an optimum of between seventy and eighty cubic centimetres while the subject is at rest. Should the rate of the heart beat be accelerated, the volume of blood passed onward from the ventricle at each contraction is lessened. In these circumstances the cardiac muscle may have to expend a larger amount of energy in order to achieve the same result. Under abnormal conditions increased peripheral resistance, disturbance of the neuro-muscular mechanism of the heart or an alteration in the viscosity of the circulating fluid may place an extra load on the heart. Often the rhythm of the cardiac beat is changed; the regular, slow contractions are replaced by hurried and irregular efforts. Such efforts act at a disadvantage and the result is that more energy has to be expended to maintain the circulation. If the disability is great, there will be a diminution in the volume of blood passed onwards within a given measure of time. For a full understanding of the condition of the heart, it is not enough to measure the alteration of peripheral or central resistance, to ascertain the extent and nature of the disturbance of the neuro-muscular mechanism and to work out the variation in the viscosity of the blood. It would be eminently desirable if the potential and expended energy of the cardiac muscle could be estimated and expressed in numerical terms. It is impossible to gauge the potential energy of the heart muscle. It is doubtful whether the maximum energy of a skeletal muscle can be computed with accuracy. No difficulty presents itself in determining the amount of energy exerted by the masseters in crushing a nut between the teeth or by the long flexors of the index finger in depressing one end of a lever while the hand and forearm are in a fixed position. But it is quite another matter to assess the maximum load that can be borne by a muscle or group of muscles. In the case of the heart the information cannot be gained by direct measurement.

In the absence of an evaluation of the cardiac reserve that can be expressed in figures, it becomes necessary to rely on the estimation of the volume of blood forced into the arteries from the ventricles at each contraction. It has been suggested that this can be measured by determining the amount of oxygen the blood is capable of holding, the amount of oxygen contained in the arterial blood and the amount of oxygen contained in the venous blood. Unfortunately the arterial and venous "unsaturation" estimated with samples of blood taken from arm arteries and veins is not an accurate measure of that of the arterial and venous blood of the body as a whole. Some observers are of opinion that the error is too great to admit of conclusions being drawn from the readings. By oxygen "unsaturation" is meant the difference between the oxygen content of a sample of blood and the amount of oxygen that the same sample of blood can be made to take up. It is expressed in cubic centimetres of oxygen per hundred cubic centimetres of blood. The output of blood is calculated by dividing the number of cubic centimetres of oxygen required by the organism per minute multiplied by one hundred by the pulse rate multiplied by the difference between the oxygen content of arterial and venous blood. Dr. I. M. Rabinowitch has made some interesting studies of the results of these measurements in association with various cardiac lesions.[1] He realizes the errors involved by selecting blood samples from arteries and veins of the arm, but he is satisfied that if standard conditions are maintained, the relative figures may be found to be of clinical significance. In order to gain some information on this point he carried out observation on ten normal persons without cardiac disturbances and ten patients with varying degrees of myocardial defect. He measured the oxygen capacity of the blood, the oxygen content of the arterial and venous blood, the oxygen consumption, the arterial and venous oxygen unsaturation, the oxygen requirement per minute and the pulse rate. From these figures he calculated the output of the heart per minute and per heart beat. The arterial oxygen unsaturation of the normal persons varied between 0.4 cubic centimetre and one cubic centimetre, while the venous oxygen unsaturation varied from 3.5 cubic centimetres to 5.5 cubic centimetres. The output per beat varied between 70.1 cubic centimetres and 99.5 cubic centimetres, with an average of 85.3 cubic centimetres. The variations are considerable and this fact signifies that the measurements are neither exact nor dependent on uniform conditions. If they are to be employed for clinical purposes it is essential to collect a very large number of readings to ascertain the range that may be regarded as physiological. Of the ten persons with heart disease two had little or no dyspnœa and a vital capacity

[1] *Archives of Internal Medicine*, August 15, 1925.

of over 1,100 litres. The arterial and venous oxygen unsaturation figures of these two persons are given as 1.4 and 8.3 cubic centimetres and 2.1 and 7.5 cubic centimetres, while the output per beat was found to be 46.2 and 40.5 cubic centimetres. A third patient with chronic myocarditis, dyspnœa, but no cyanosis had an output of 31.2 cubic centimetres per beat. Two patients had some orthopnœa and cyanosis; their output was 27.0 and 38.4 cubic centimetres per beat. The remaining five patients manifested severe dyspnœa and orthopnœa as well as much cyanosis. The output of their ventricles per beat varied between 13.6 and 31.2 cubic centimetres. The vital capacity figures appear to have a tendency to follow the output figures. It thus transpires from these few observations that while the degree of cardiac muscle failure cannot be measured by the figures of the output of the ventricle, some correspondence is found between these readings and the clinical signs and symptoms. The methods employed should be investigated with great care, since Dr. Rabinowitch's observations have revealed some interesting data. With improved technique, better standardization of the basal conditions and the elimination of disturbing factors, the estimation of the volume of blood thrown into the arteries by the ventricle at each beat may be found to give valuable information in the early and mild forms of myocardial failure.

WEIL'S DISEASE.

In 1886 Weil described a peculiar form of acute infectious disease characterized by jaundice, swelling of spleen and nephritis. His observations were limited to four patients and he could not determine whether the condition was a rare or unrecognized form of an existing disease or whether it represented a new clinical entity. A disease of the character described by Weil was not new, but after he had drawn attention to it, his name was affixed to it and it was accepted as a separate disease. The ætiology remained obscure until Inada and his coworkers in Japan described a spirochæte which they found in the blood and urine of affected persons. This organism they named the *Spirochæta icterohæmorrhagica*. Ido subsequently found that the disease was most prevalent in localities in which the soil was alkaline or neutral. He came to the conclusion that the spirochæte offered but weak resistance to acid media. The *Spirochæta icterohæmorrhagica* has been found in a large percentage of rats. Uhlenhuth and Zuelzer found it in 10% of eighty-nine rats examined in Berlin. The spirochæte was pathogenic to mice and guinea pigs. They pointed out that it readily escaped detection and expressed the opinion that carriers were more numerous than would appear from their work. C. J. Martin confirmed the findings in rats on Gallipoli and other workers have done the same. Dawson and Hume and Bedson have described the course of the illness as being characterized by jaundice with hæmorrhages followed by a remission and a second rise in temperature. They held that the *Spirochæta icterohæmorrhagica* could be recovered from the blood during the first seven days and that after that it could be found in the urine. Basile inoculated guinea pigs with the virus of *Spirochætosis icterohæmorrhagica* and found that the clinical picture was not always complete. Jaundice did not always occur, but hæmorrhage was invariably found. This is of interest because Dawson and others have expressed the view that the spirochæte may cause the disease without producing jaundice. In fact the clinical character of the disease manifests considerable variation, as in the psychomeningeal form described by Costa and Troisier.

A peculiar form of acute hæmorrhagic jaundice was described in 1920 by Symmers. It was apparently of infective origin, was of an epidemic nature and had a high mortality. The clinical and *post mortem* features are very similar to those of *Spirochætosis icterohæmorrhagica* and yellow atrophy of the liver. No spirochætes, however, were discovered, even after inoculation of guinea pigs with both blood and urine. These investigations were carried out in eight persons suffering from the disease. The possibility of phosphorus poisoning was excluded and the conclusion formed was that the epidemic was due to some new and previously undescribed infection absorbed apparently from the alimentary canal. Reference to work along these lines is mentioned by Dr. Joseph Sailer when reporting two cases of Weil's disease.[1] In the first place Blumer held that leptospirosis (Dr. Sailer follows Noguchi and uses the term *Leptospira icterohæmorrhagica*) was not common in the United States. He studied the types of the infection and noted that 72% of the infections occur in the autumn and winter, that the disease is mild, common in young persons and that the leptospira is never found. Dr. Sailer regards this statement as important, but adds that it must be accepted, if at all, with great caution. Wadsworth studied three hundred cases of infectious jaundice and reported that no leptospiræ were found. The conditions were unfavourable, but one of the laboratory workers, while inoculating rabbits with virulent leptospiræ obtained from rats, pricked her finger. She had a typical attack of Weil's disease and *Leptospiræ hæmorrhagicæ* were found in the blood. In a bacteriological note to Dr. Sailer's paper Dr. J. C. Small points out that blood from the patient should be used during the first four or five days of the jaundice and injected intraperitoneally into guinea pigs. After that time and up to the tenth day blood and urine should be used and after the tenth day urine only should be employed.

It has not yet been proved that all febrile epidemic jaundice of this nature is due to the *Spirochæta icterohæmorrhagica*. The subject is of interest to epidemiologists in Australia, because no case of *Spirochætosis icterohæmorrhagica* has so far been reported within the Commonwealth. This is the more remarkable for, as Dr. Sailer puts it, the rat is universal and the spirochæte seems to accompany it everywhere.

[1] *The American Journal of the Medical Sciences*, September, 1925.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

A Culture Medium for the Gonococcus.

F. W. Mulsow (*Journal of Infectious Diseases*, April, 1925) describes a medium for the cultivation of the gonococcus which he has found particularly useful in the isolation of this organism from the cervix of patients with chronic gonorrhœa. It was found that the gonococcus does not produce acid in the presence of maltose and lævulose, while all other organisms isolated from cervical and urethral cultures which form colonies resembling the gonococcus, were found to produce acid with these carbohydrates. Five hundred cubic centimetres of distilled water are added to 0.45 kilogram of lean beef and allowed to stand over night in the ice box. In the extract of this ten grammes of peptone are dissolved while the extract is cool and to the mixture are added five hundred cubic centimetres of 3% agar which has been melted and cooled to 60° C. The reaction is adjusted to + 0.9 to phenolphthalein. Before the agar has cooled sufficiently to harden it is heated in the autoclave at two atmospheres' pressure for twenty-five minutes. It is then filtered through moistened cotton and Canton flannel, placed in one hundred cubic centimetre amounts in flasks and sterilized before the agar has hardened. The reaction is usually near pH 6.8. Half a gramme of lævulose or maltose are added and one cubic centimetre of a 0.04% solution of brom-cresol purple. When ready for use the agar is melted and cooled to 60° C., fifty cubic centimetres of ascitic fluid are added and plates poured. With brom-cresol purple as an indicator a definite yellow tint surrounds the acid-producing colonies.

Leprosy in the Philippines.

G. R. Callender and Theodore Bitterman (*Philippine Journal of Science*, May, 1925) present some observations regarding the study of leprosy in two hundred and fifty-nine lepers in the Philippines. Anæsthesia as the primary symptom was noted in 78.2% and in 90% an exposed part of the body was the site of the earliest lesion. These findings are regarded as at least suggestive of the possibility that infection in the majority of instances arises through contact of leprous material with abrasions or wounds of skin surfaces and that an intact integument is a protection against the disease. The first lesion to be noticed occurred in the lower extremity in 63%. It was noted that in adults who acquired the disease from their children, the first lesion is most likely to appear on a part of the body in contact with the child, as the arm or waist according to whether the child is carried on the arm or astride the hip. The average time between the first symptom and diagnosis was 2.47 years; between diagnosis and segregation 0.42 years; between the first symptom and the appearance of skin lesions 1.12 year.

Macrophages and Bacterial Infections.

Waro Nakahara (*Journal of Experimental Medicine*, August, 1925) details experiments undertaken to elucidate further the significance of the macrophage reaction in resistance to bacterial infection. The method of inducing a macrophage reaction in the peritoneal cavity by means of oil injection was adopted. Mice were used and the peritoneal cavity was injected with 0.2 cubic centimetre of commercial olive oil. Following the injection a polymorphic reaction developes, but in forty-eight hours this is replaced by mononuclear cells. These cells are found in very large numbers for a few days and gradually disappear in the course of two weeks. Oil injections do not bring about a perceptible increase in the total cell counts, but whereas one day before oil injection the percentage of macrophages was 13.3, forty-eight hours later the percentage was 74 and five days later 79.1. Experimental evidence was obtained that *Bacillus coli communis* injected into the peritoneal cavity previously treated with oil disappeared much more rapidly than in normal peritoneal cavities. That the general resistance of animals injected intraperitoneally with oil is not increased was proved by introducing the *Bacillus coli communis* into the pleural cavity instead of the peritoneal. No difference was found between the animals previously injected with oil and those not so treated. Further experiments proved that animals injected with oil survived multiples of the fatal doses of staphylococcus and pneumococcus when inoculated intraperitoneally with these organisms. The amount of oil injected was proved to be incapable in itself of inhibiting bacterial growth and the cell-free exudate from an oil-injected animal was also incapable of inhibiting this growth. On the other hand the macrophages in the exudate were found to be actively phagocytic as regards the bacteria introduced into the peritoneal cavity. The author concludes from these facts that the increased resistance noted is due primarily to the action of the macrophages.

Fæcal Flora in Pernicious Anæmia.

L. Mary Moench, Morton C. Kahn and John C. Torrey (*Journal of Infectious Diseases*, August, 1925) review the work of other investigators into the question of the association of intestinal intoxication with pernicious anæmia and on the assumption that the colon may be the source of the pathogenic agent they analysed the bacterial content of this portion of the alimentary tract. Specimens of stools from thirty-three patients suffering from pernicious anæmia of various periods of duration were examined, a general survey of the aerobic organisms and a more detailed study of the anaerobes being carried out. A noteworthy feature was the uniformity in the predominant bacterial types and their numbers. The uniformity was much greater as regards pernicious anæmia than for any other pathological condition and the observations of other workers as to the unusually active growth of bacteria throughout the intestinal canal in this disease were corroborated. The most predominating aerobic organisms were the *Bacillus coli communis*, streptococci and at times the *Bacillus acidophilus*. The streptococci were very numerous and in 50% of the cases outnumbered the *Bacillus coli communis*. Such of the strains as were subjected to typing tests conformed to the intestinal variety. No hæmolytic strains were recovered. The most significant feature revealed in the examinations was the uniformly high count for *Bacillus welchii*. In the great majority of instances this organism was recovered alone in the anaerobic cultures. In view of the possible relationship between the potent hæmolysis of *Bacillus welchii* and the destruction of red blood cells quantitative tests of the hæmolysin production of the strains of this bacillus isolated in cases of pernicious anæmia were undertaken. The organisms were grown for eighteen hours in a highly buffered medium and graded amounts of these cultures were added to tubes containing a mixture of washed sheep's cells and normal saline solution. The tubes were incubated for one hour in a water-bath at 37° C. and examined for evidence of hæmolysis. Although most of the strains were strongly hæmolytic, they did not exhibit greater potency in this respect than did strains from normal intestines. The authors conclude, therefore, that if *Bacillus welchii* is to be considered as an ætiological factor in pernicious anæmia, it must be on the basis of the excessive numbers and activity of these organisms particularly at levels of the intestine where absorption is active and where they are usually only found in numbers which are negligible.

HYGIENE.

The Dust Hazard in the Abrasive Industry.

W. Irving Clark and Edward B. Simmons (*Journal of Industrial Hygiene*, August, 1925) point out that during the past ten years the use of artificial abrasives in industry has increased enormously and the preference in almost all metal trades for these abrasives in the form either of grain or of grinding wheels, has made a study of the hazard of abrasive dust inhalation of great importance. The natural sandstone wheel which is known to be productive of silicosis is

now used only in the manufacture of cutlery and axes and even in these industries it is being slowly replaced by the artificial abrasive wheel. Some idea of the amount of the artificial abrasives required by industry is shown by the fact that the United States alone in an average year produces twenty-seven million kilograms of artificial grinding wheels. The two artificial abrasives in most common use are aluminium oxide and silicon carbide. In both cases the crystal is hard, tough, of a cutting power near that of diamond and, when divided, wedge shaped in form. In the crushing and classing of these crystals into the different sized grains, as well as in the manufacture of grinding wheels, large quantities of dust are produced. The workers are protected from the worst of this dust by dust collection suction systems which remove the greater part of the dust occurring at or about the machines. There is, however, a considerable amount floating in the air of the dusty departments. The authors' study is clinical in character and represents fourteen years' experience in the largest single abrasive and grinding wheel factory in the world. They show that in the manufacture of abrasives there are four departments in which the processes are very dusty. These are the abrasive department where the lumps of abrasives are crushed into grain and graded; the shaving department where the dry wheels, still in clay form, are shaped on a special type of potter's wheel; the trueing department in which the now vitrified wheels are cut to exact size on specially constructed lathes; the clay department where the clays which make up the bond in the wheels, are weighed and mixed. The dustiest of these is the last. In all departments where abrasive dust occurs, very complete dust removal systems have been in operation for years and at present the amount of dust collected by this system daily is 5,400 kilograms. A group of seventy-nine men who had been employed ten or more years in dusty departments, were examined and X ray pictures of their chests were taken. The conclusion arrived at from these was that in factories which provide proper methods of dust removal, the continuous inhalation of artificial abrasive dust extending over many years does not produce the symptoms or present the X ray findings of pneumoconiosis. On analysing the causes of all deaths at the works over a period of thirty-two years it was found that 6.5% of all deaths were due to pulmonary tuberculosis. This was very little higher than the percentage due to pulmonary tuberculosis in the city in which the works were situated. Finally on reviewing the cases of pulmonary tuberculosis among the work's employees during the past ten years, they show that the percentage of cases of pulmonary tuberculosis was higher in the dusty than in the non-dusty departments, but that the percentage in all departments was 0.014% of the working force, so that the risk does not appear great. The authors emphasize the view that this satisfactory state of affairs is due to the fact that all machines on which the artificial abrasive wheels are mounted, are properly hooded and excessive dust is removed by suction fans.

Study of Punctate Basophilia in Lead Workers.

ARTHUR SELLERS (*Journal of Industrial Hygiene*, April, 1925) states that his observations commenced in 1921 on punctate basophilia in lead workers were carried out at the workshops of the Chloride Company, manufacturers of electrical accumulators, where about five hundred employees are under the special regulations for lead workers. The works are situated in a large open valley in semirural surroundings and are divided into a number of separate sheds. The buildings are of modern construction and much attention is given to the hygienic welfare of the men by providing canteens, recreation grounds, washing accommodation, overalls, fans and various other apparatus. The employees stay longer than at most works where exposure to lead is inevitable and their general physique and social standards are higher than those of the average casual labourer. During the period 1921 to 1924 records of 427 men and blood films from 158 were collected. From the results it seems that the best man to employ in conditions involving exposure to lead —the man most likely to maintain his health—is one of about average height and weight who has good teeth, low blood pressure and no defects or injuries, one who is a non-smoker and more or less of an athlete. The author's conclusions are: (i.) The methods employed in detecting punctate basophilia are simple and capable of being applied on a large scale. The enumeration of the number of punctate cells present is subject to inaccuracies, some of which are not capable of complete elimination by technical skill and personal diligence. (ii.) The presence of punctate basophilia is an extremely delicate method of detecting lead absorption. A blood examination is of great value to the clinician. It will often bring to light cases of lead absorption in which the signs usually relied on are non-existent. (iii.) The degree of punctate basophilia determined by an estimation of the number of punctate red cells present affords an indication of the amount of absorption taking place. A blood film is frequently of great value as a warning or danger signal. (iv.) A blood film examination cannot be relied upon as a crucial test to distinguish between lead absorption and lead poisoning. The chief value of a blood film examination rests in the fact that it supplies an objective sign outside the control of the patient and affords a piece of medical evidence which must be considered along with whatever evidence is available in making a diagnosis. Punctate basophilia is probably present in practically all cases of lead poisoning, but it may be absent or present only intermittently. Therefore, absence of basophilia should not be regarded as conclusive, unless repeated examinations have been made within a reasonable time of cessation of work. In typical cases of lead colic punctate basophilia is almost invariably present; absence of basophilia in cases of that type is strong evidence against lead poisoning. A slight degree of punctate basophilia should be regarded as practically a normal condition in men exposed to lead and is therefore a piece of evidence of no diagnostic value. A high degree is of greater diagnostic value, but it is by no means a definite proof of lead poisoning. The writer is not prepared to say what constitutes a high degree, though he regards the standards of three hundred per million as certainly too low.

Hazards of the Tanning Industry.

DOROTHY K. MINSTER (*The Journal of Industrial Hygiene*, July, 1925) states that the average industrial medical practitioner working in one more or less restricted field of industrial medicine, is apt to believe that occupational diseases or occupational disease hazards are the exception rather than the rule. To disprove this assumption she has studied and collected a list of all the potential occupational diseases and their causes in one particular industry—the tanning industry. Her list includes forty-two processes or substances which may cause and in many instances do cause disease among the exposed workers. Tanning is not a highly standardized process; on the contrary, it is an individual one, varying with practically every manufacturer. There is no standard recipe for tanning hides; many ingredients used in America, are not used in other countries and *vice versa*. Processes, again, vary within just as wide limits in the tanning of various kinds of leather. Sole leather is tanned by a process generally quite different from that used for belting or harness leather. Light leathers, such as chamois, kid *et cetera*, are produced by a tanning process quite different from either of the above. She then goes on to show that no process in the industry is without its hazards and examines carefully the various processes of storage, preparing, tanning, finishing, dyeing and enamelling, concluding with a list of general hazards. In all forty-two are listed, including the following: Anthrax, cyanide poisoning, parasitic fungi, arsenic poisoning, leather dusts, naphtha, benzol and carbon monoxide. She concludes by pointing out that some of these hazards are only potential, but many of them have actually occurred in the course of work in the tanneries under her observation and others are recorded in the literature.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, Adelaide Street, Brisbane, on August 7, 1925, DR. VAL. MCDOWALL, the President, in the chair.

The Normal Heart.

DR. H. HUME TURNBULL (Melbourne) read a paper entitled: "The Diagnosis of the Normal Heart" (see page 573).

DR. D. GIFFORD CROLL, C.B.E., said that he was glad to hear what Dr. Turnbull said of the importance of symptoms. He quoted from notes of two patients under observation for about a year before death. No physical signs indicative of a serious condition had been detected until the last two months, but symptoms had been grave and steadily progressive throughout the whole period.

He also quoted the case of a patient who had come complaining of pain in the epigastrium. After careful examination he decided that the heart was sound. The patient had dropped dead in the bank next morning. He wished to know if heart tension should necessarily be detected in all such cases.

In regard to extra systole he had been accustomed to attach significance to it when associated with other indications of a pathological heart condition. He had known at least two patients with extra systoles who had developed auricular fibrillation. He had also examined a number of soldiers after very severe strain during the war and the percentage of extra systoles found had been quite abnormal. For these two reasons he was inclined to attach significance when associated with other signs.

DR. E. SANDFORD JACKSON said that they had listened to a feast of reason and common sense. He desired to draw special attention to the dangers of speaking of the heart as being "a little weak" and of the effect it had on the patient. To illustrate his remarks he referred to rowing and the damage it was supposed to have done to many young men.

DR. E. S. MEYERS asked what was the cause of sudden death in diphtheria. Was there any previous affection of the heart in these patients? When extra systoles occurred in fat people between fifty and sixty years of age, what were the signs which indicated a change to auricular fibrillation? He would like to know what would be of assistance in the prognosis of these conditions.

DR. STEWART COWEN said that the address had emphasized the need for careful detailed examination. It gave the patient great confidence as well as reassurance. He referred to one of his patients who experienced anginal attacks on coming out of a theatre owing to a change in temperature. It was very important to look for focal infections. Thyreoid insufficiency might often give a key to the line of treatment.

DR. N. W. MARKWELL considered that the address was a fine exposition of the relative value of symptoms in the evaluation of the heart. He asked Dr. Turnbull if he had seen many patients suffering from syncope in conjunction with congenital disease. He also inquired whether Dr. Turnbull had had any experience of epigastric pain which had a cardiac significance. The patient often stated that he had an epigastric pain, but when asked to indicate the site, he placed his hand over the sternum. In other words he indicated that the condition was a true angina.

DR. ELLIS MURPHY said that he occasionally saw patients who were very ill and who had a mid-diastolic or pre-systolic bruit pointing to mitral stenosis. The diastolic murmur was soon lost and the patient died in a few days.

DR. R. MARSHALL ALLAN, M.C., emphasized Dr. Jackson's remarks regarding the effect on a patient of telling him that his heart was a "little tired" or "weak" when more careful examination would have shown that the cause of the symptoms was perhaps oral or nasal trouble. In regard to heart disease in pregnancy he said that of twelve hundred patients seen at the antenatal clinic at the Lady Bowen Hospital eighteen had suffered from mitral stenosis. Twelve of these had been delivered without any trouble. The remainder were still attending the clinic and manifested no untoward symptoms.

DR. VAL. MCDOWALL considered that few hearts were damaged by rowing. Injudicious training by the coach was more responsible for damage than the actual rowing itself. While he could detect a moderately abnormal heart with X rays, he was not so sure of himself with early cases. Frequently he saw abnormal shadows, but the clinician made no mention of clinical symptoms in his report. More cooperation was needed between the radiologist and the pyhsician.

DR. HUME TURNBULL after thanking those present for the reception of his paper said that he did not suggest that the examination of physical signs was of no value. It was most important especially with mitral stenosis. Many patients manifested few symptoms and these frequently disappeared. He had seen many men who had done up to two years' hard active service without manifesting symptoms. It was very difficult to predict whether a patient would die suddenly or not, except those suffering from syphilitic aortitis. He was very afraid of elderly people with arterial sclerosis and low blood pressure associated with syncope and vagus arrhythmia. They generally died within two or three years either suddenly or gradually. In regard to the extra systoles in Dr. Croll's patients he was not sure whether they were auricular or ventricular. Mackenzie had not considered them to be of any importance. Many damaged hearts did not manifest them and they were also present in others with no symptoms. There was no definite practical evidence of their value. In the diagnosis between extra systoles and auricular fibrillation the stethoscope would help if the heart beats were counted. Hearing was not sufficient, it was necessary to count the beats so that irregularity could easily be recognized. Other means which would assist, were the use of amyl nitrate, exercise and mechanical methods. There was a big gap in knowledge in regard to diphtheria. In fatal cases gross myocardial damage was often found, but no one could say that this covered the whole ground. In connexion with rheumatism in children it was important to tell the child what it meant and to emphasize that in any case sudden death would not occur. This would restore the confidence of the child. He was impressed by Dr. Jackson's view on rowing. He had never seen a patient with a normal heart damaged by sport. Sudden cold air was to be guarded against by patients suffering from syphilitic aortitis and anginal conditions. Patients often got attacks of pain on going to bed. The attacks would be stopped if the bed was first warmed. If they still occurred, the condition was usually severe.

In regard to heart disease in pregnancy he had modified his views on the deadliness of mitral stenosis. Many patients went through their labour easily. The time of death in married women with families was the same as that of single women; it was not much over forty for those whose cardiac condition was genuinely of rheumatic origin. The majority of patients required no more care than those with normal hearts. The ordinary X ray film gave a very distorted view of the finer details. The slipper shaped shadow was not due to the heart, but to aortic dilatation. In aortic and associated conditions radiography was most valuable.

MEDICO-POLITICAL.

THE attention of members of the Victorian Branch of the British Medical Association is directed to an error in the time table published in THE MEDICAL JOURNAL OF AUSTRALIA of October 31, 1925, page 543, in the syllabus of the November post-graduate course in Melbourne. The annual conference of members of the Victorian Branch will take place on November 17 and 18, 1925, at 8.15 p.m. and not at 2.15 in the afternoon.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

D'Ombrain, Arthur Wolseley, M.B., Ch.M., 1923 (Univ. Sydney), 205, Macquarie Street, Sydney.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Speeding, Keith Rennick, M.B., B.S., 1925 (Univ. Melbourne), Ringwood.
Stephens, Frank Gladstone, M.B., B.S., 1925 (Univ. Melbourne), Malvern.
Seeley, Dudley Munster, M.B., B.S., 1924 (Univ. Melbourne), Mildura.
Robinson, Gwendolen Winefred May, M.B., B.S., 1925 (Univ. Melbourne), Preston.
Godbehear, Blanch May Annie, M.B., B.S., 1925 (Univ. Melbourne), Bairnsdale.
Langlands, Francis Clive, M.B., B.S., 1925 (Univ. Melbourne), Melbourne Hospital.
Maggs, George McIntyre, M.B., B.S., 1925 (Univ. Melbourne), Ivanhoe.
McLean, Ian Gideon, M.B., B.S., 1925 (Univ. Melbourne), Malvern.
Chambers, Keith Leslie, M.B., B.S., 1925 (Univ. Melbourne), Melbourne Hospital.
Caulfield, Henry George, M.B., B.S., 1925 (Univ. Melbourne), Hampton.

Medical Prizes.

THE CAUSES AND PREVENTION OF MATERNAL MORBIDITY AND MORTALITY.

IN our issue of September 19, 1925, we announced that the authors of the two essays declared by the committee appointed by the Melbourne Permanent Committee for Post-Graduate Work to be *proxime accessit* in the prize competition are Dr. Marie Brown and Dr. Hubert Jacobs.

The following is a summary of the essay by Dr. Marie Brown.

General Considerations.

Dr. Marie Brown points out that the onward march of evolution and human development is not a straightforward process. At times it appears to be retrograde. The retrogression may be the result of imperfect or imperfected schemes. One of the seeming anomalies is the conversion of a normal physical process into a process that is abnormal and pathological. Childbirth has become a process fraught with pain and penalty in which birth and death go hand in hand more often than is seemly. The thinking world has awakened to this fact. She holds that the world-wide agitation on the question of maternal mortality and morbidity should lead to the introduction of action.

During the past twenty to thirty years there has been very little reduction in the maternal mortality. She gives a table to show that during the decade 1914 to 1923 the death rate from diseases in the puerperium has varied from 4.3 to 5.6 per thousand registered births in Australia and from 3.8 to 5.3 in England and that practically no improvement has taken place. In some countries the figures are even worse, although she admits that this may be due in part to different methods of compiling statistics. A very decided decrease has taken place of late years in the infant mortality. She claims that the same organized attack as has been carried out on the high death rate of infants, should be made on the high death rate of mothers. The problem is not merely a national one. It can only be carried out satisfactorily by the cooperation of all nations. She states that the problem is not purely medical, but is chiefly a question of economics and education. She holds that it must be met by legislation which is the outcome of public opinion. Public opinion must be educated to demand reform and for this half measures are useless. It is not a question to be handled exclusively by the doctor, for he among others has yet to be educated. He has to think of himself first as a human being and be prepared to set on one side for a time the question of his professional prestige and financial interest.

Maternal mortality is probably of less importance than maternal morbidity. The former is more easily gauged and rectified, while the latter is at present unclassified. Beyond the probable fact that the enormous amount of gynæcological work carried out in hospital and private practice is largely the harvest of bad obstetrics, there is no means of measuring the extent of disease directly or indirectly due to childbirth. The immediate causes of maternal mortality and morbidity are puerperal sepsis, injuries and accidents during the puerperium and intercurrent disease. These are the results of remote causes of a more fundamental nature. All can be lessened by a scientific and united attack. Dr. Marie Brown claims that the ultimate causes of maternal mortality and morbidity are two and only two. They are economic stress and lack of education.

Dealing with economic stress, she turns first to poverty leading to overcrowding, insanitary and unhygienic surroundings, personal uncleanliness, poor physique and intercurrent disease. The second factor is the employment of women in unsuitable industries and under adverse circumstances. This during pregnancy conduces to increased liability to puerperal morbidity and mortality. The third factor mentioned is extramarital pregnancy and abortion. The unmarried mother has always a worse chance of successful maternity than the married; abortion is a prolific source of morbidity in after life. She places lack of domestic help as the fourth factor of economic stress and points out that this forces the mother to work unduly during pregnancy, deprives her of opportunity to use the hospital and compels her to return to her duties while she is in a debilitated condition. The last factor is the shortage of suitable beds in hospitals and nursing homes for women in labour. This deprives the student, midwife and practitioner of material for training.

Under the heading of lack of education she recognizes the factor of the ignorance of the public in matters of hygiene in general and hygiene of pregnancy in particular. It leads to personal indolence and a reluctance to demand better methods. The second factor is lack of sex education, which gives rise to practices and abuses that are detrimental to physique and mind, and tends to make the prospective mother less fit for childbirth. In close connexion with this there is the lack of education of women in regard to the special function of pregnancy. If women were educated concerning the proper nursing and medical care, they would demand the best and thus create a supply.

Dr. Marie Brown adds three further factors which belong to both economic stress and lack of education. They are the lack of antenatal supervision and accommodation, bad obstetrics and intercurrent disease. In regard to the first she declares that if it were possible to carry out only one idea in the fight against maternal morbidity and mortality, that one should be antenatal supervision. She holds that bad obstetrical practice is the outcome of ignorance on the part of the public and the practitioner and the difficulty in the financing of reforms. Before leaving causes she adds that there is one which comes under neither of the two headings. It is inaccessibility.

While she finds it relatively easy to classify the causes, she holds it to be very difficult to construct a scheme for their removal. The first proposal is the education of the public. This should be followed by legislation aimed at the alleviation of economic stress in its special bearing on the problem under discussion. Premature legislation would be detrimental to success. She believes that if the public be first enlightened on all matters connected with maternal mortality and morbidity, a scheme should be devised and each remedy applied piece by piece as opportunity presents itself.

To combat poverty she dismisses general industrial improvement as outside the scope of her paper. The maternity allowance at birth should be augmented by some form of pregnancy benefit or prenatal allowance in districts where poverty is greatest. Similarly a postnatal allowance might be provided. She advocates facilities for obtaining skilled nursing and medical attendance, domestic help and hospital accommodation. Maternity outfits and clothing for infants should also be granted in cases of need. Private agencies whose functions cover these philanthropic efforts, should be subsidized or there should be a coordination of these agencies, the local health bodies, the municipal authorities and other governmental institutions. All these aids should be subject to some income limit restriction. Maternity and postnatal allowances should be conditioned by a preceding prenatal supervision. To render this feasible notification of pregnancy should be introduced.

To remove the disadvantages of employment of women under unsuitable conditions, she looks to the development of what is now known as industrial hygiene. This is at present largely in the hands of individual firms. The suggestions for the diminution of artificial abortion include increased industrial reform, better factory laws, welfare work and higher wages for men. Education in sex matters during girlhood, notification of pregnancy and a conditional maternity allowance would also contribute to the reduction of extramarital pregnancy and attempts to procure abortion. The suppression of advertisements pertaining to abortion in the press and some practical method of dealing with abortionists and of those who recommend or sell abortifacients are urgently needed. In regard to the provision of domestic help Dr. Marie Brown refers to a scheme that is in existence in Liverpool. The scheme was started by the Women's Service Bureau; women are paid a good wage while working and a small retaining fee when off duty. They do the ordinary work of the mother in a household, but are forbidden to take any part in nursing. The mother contributes what she can afford and the service pays the rest.

The lack of sufficient hospital accommodation for women in labour acts adversely by preventing the student and midwife from obtaining a thorough education and training and depriving the woman in poor circumstances of efficient treatment and nursing. Even for those who are not poor, there is an insufficient provision of beds in the better maternity homes. The author expresses the opinion that while the hospital accommodation is inadequate, the quality of the work in many of the institutions is poor. This, she holds, is the result of financial difficulty. To increase the supply of maternity beds the public hospitals dependent on voluntary contributions should make special appeals to the public for funds. Governments and municipalities must be compelled to recognize the need of extra expenditure both for the purpose of subsidizing existing private and voluntary hospitals and homes and for the purpose of establishing others. In addition there should be stricter legislative control of the staffing and equipment of all maternity homes. The unsupervized charitable institution managed by a group of benevolently minded but scientifically ignorant people must either be eliminated or be subjected to the same rules and control as a governmental hospital.

Dr. Marie Brown deals with the maternity home conducted by the "Sairey Gamp" nurse. She is thoroughly incompetent. At times she leaves all the nursing work of the patients in her home to a "very low type of domestic help" whom she employs at a small wage under the enticement of training the help to be a midwife. This may be contrary to the law, but is not uncommon.

All large public hospitals should have an obstetric and gynæcological section. In this section the author includes prenatal out-patients' clinics, lying-in wards and an affiliated externe department. There should be free beds. She advocates separate wards for patients with septic conditions and for patients with venereal diseases. The section should be under the charge of a full time resident or visiting specialist. Both the resident medical superintendent and the head nurse must be expert and competent to teach.

The proposals put forward in regard to the enlightenment of the public and of prospective mothers include the teaching of hygiene and elementary physiology in schools to elder scholars. Next a maternity health week should be established. The teaching during this week should be by lectures, newspaper articles, demonstrations and exhibits. This should be followed by a vigorous campaign continued for several months. The campaigns could be organized by the Ministry of Health, the Branches of the British Medical Association, the public health associations, the municipal health authorities and similar bodies. The material used in lectures, articles and so forth should be determined by the local medical authority and special care should be exercised that the right teaching only is embodied in all printed matter. Travelling lecturers should be engaged to travel to outlying country districts. When public opinion has been educated, the next step is started. Prenatal supervision institutions must be established. She maintains that in this way sepsis can be prevented or lessened in incidence by the avoidance of injury during delivery. She deals with the advantages of prenatal supervision in enabling the practitioner to anticipate difficulties and to apply the proper remedies at an early stage.

She would utilize the prenatal clinic for the purpose of encouraging a friendly relationship between the medical practitioner and the midwife. She suggests a close coordination between the prenatal clinics, the venereal diseases clinics, the prematernity and postmaternity wards and other departments of the hospitals.

Bad midwifery is traced to the inadequate teaching of medical students and midwifery nurses, to the lack of facility for post-graduate study and to the imperfect conduct of obstetrics in private practice. She advocates a lengthening of the training in obstetrics, gynæcology and the care of infants. The training in obstetrics should include lectures and clinical demonstrations, attendance at prematernity and postmaternity clinics, residence in a lying-in hospital, externe practice and attendance in special departments. The lectures should be as few and as practical as possible. During the first period of residence the student should be instructed in all that pertains to normal and abnormal scientific midwifery. He should conduct unaided a minimum of five deliveries under supervision and should take part as assistant or observer in other deliveries during the period of his residence. At first he should receive supervision in his work outside the hospital, but later he should conduct from ten to fifteen deliveries unaided. The teachers should be obstetricians of experience, not newly qualified graduates. If an experienced obstetrician is not available, the student can be better trained by a competent sister-midwife than by a junior medical officer.

The training of midwives is more difficult. Dr. Marie Brown thinks that improvement might be effected if all large hospitals included midwifery nursing in their ordinary course. She deplores the poor mental development and education of the majority of women practising as midwives. The "Gamp" type must die out, but as long as women with a "slender equipment of knowledge" are allowed to become registered, the standard will remain too low.

The first step in advance should be the encouragement of a higher type of midwife. This can be done only if inducements are sufficiently great. Help might take the form of free education during training or monetary payments. The fees for midwives should be raised or augmented in order that a midwife might make a decent living. All untrained competitors should be eliminated. Dr. Brown would make it a criminal offence for anyone other than a doctor or registered midwife to deliver a woman. The only exception should be if no doctor or midwife could be obtained. In the next place she proposes that the training should be lengthened and its standard raised. She would provide facilities to enable the midwife to refresh her knowledge after she has completed her training. She refers to a scheme in action at Blackburn in Lancashire, where a very large proportion of the midwifery is conducted by midwives. She suggests that an organization for midwives similar to those in existence

for nurses would be an advantage. She recommends call offices for registered midwives. The training should include systematic lectures delivered by specialists or highly trained matrons or sister-midwives. The work should be taken partly in residence at a good maternity hospital and partly in an attached district. The training must be continued for nine months to one year. During this period she should deliver unaided not less than twenty-five women.

On the subject of obstetrics in general practice the author states that there is not enough opportunity for post-graduate work. As the busy general practitioner cannot afford the time or money needed for a full course in obstetrics, she proposes that encouragement should be given to general practitioners to attend at casual times and to benefit by frequent short courses with lectures and demonstrations on special subjects. There should also be inducement for him to attend the prenatal and postnatal clinics. She favours some supervision of the medical practitioner from the national point of view. The maternity benefit might form a sort of control. The allowance should be contingent on the submission of a form signed by the attending practitioner, to include such data as the pelvic measurements, the results of several urine tests, the results of blood pressure readings and a short *résumé* of the particulars of the confinement.

In the next place Dr. Marie Brown pleads for more cooperation between the medical practitioner, the midwife and the institution. The relationship between the doctor and midwife should be one of confidence. The doctor should be able to hand over some of his work to the midwife with safety. The advice of a specialist at present can be obtained in two ways only. Either the patient has to pay a large fee, which few can afford, or the patient has to be referred to a hospital and then the practitioner loses his patient. Some arrangement through the agency of a local authority, institution or charity should be effected whereby a specialist's services could be requisitioned at a small cost.

The opinion is expressed that bad midwifery depends to some extent on the fact that it does not pay. In very few places are the fees adequate. The fees should be raised so that practitioners could afford to give more time and attention to each patient. The maternity allowance could be regulated so that the whole or part could be paid to the doctor, nurse or midwife. An alternative is that the local authority might pay part of the fee for poor people in districts where hospitals are not available. More hospital accommodation, a larger supply of competent midwives and an extension of the outside work of students would provide sufficient attendance on many women who at present pay poor fees to an overworked doctor in return for very poor treatment.

Sterile outfits can be provided at small cost both for doctors and midwives. This would save time and obviate the risk of something being forgotten in the doctor's or midwife's bag.

Emphasis is laid on the urgent need for prenatal supervision and for team work in crowded districts.

In inaccessible districts the bush nurses perform a very valuable service. Their usefulness might be extended by Government subsidy. Aviation facilities might be provided for doctors, nurses and midwives in certain outback places. Lastly, the author looks to the issue of leaflets and booklets of instruction by health authorities for the education of the people in distant places.

Correspondence.

HIGH VOLTAGE APPARATUS.

SIR: I read with appreciation the excellent article by Dr. A. H. Thwaites on "Some Recent Advances in Cancer Work," which appeared in THE MEDICAL JOURNAL OF AUSTRALIA of October 17, the section dealing with physical research being of particular interest.

In this section it is stated that 250,000 volts is the maximum voltage which may be used with reliance in the generation of therapeutic X radiation and that the shortest wave length derived from the most modern and most efficient apparatus is 0.06 of an Ångström unit.

It is interesting to note in this connexion that Établissement Gaiffé, Gallot et Pilon, of Paris, have quite recently developed an X ray apparatus generating a constant tension of 600,000 volts and exciting a minimum wave length in an especially developed tube of 0.025 of an Ångström unit. This firm is now engaged in experimenting with direct current voltage generators, capable of delivering pressure of 1,000,000 volts to the terminals of an X ray tube. This tube voltage, according to Plank's formula, will excite X rays to a minimum wave length of 0.012 of an Ångström unit.

A plant generating 600,000 volts is in the hands of Professor Perrin, of Paris, and this investigator has commissioned Gaiffé, Gallot to produce for him a similar type of apparatus delivering a direct voltage to the external circuit of 10,000,0000 volts.

Dr. Thwaites has indicated the necessity for exact measurements of voltage (wave length) and current and points out that the methods used at present do not allow of precise determination of these important dosage factors.

Drs. Dauvillier and Ledoux-Lebard, in a paper read before l'Académie des Sciences, Paris, of March 6, 1916, stressed the necessity for exact measurement of X ray dosage in therapy and demonstrated the impossibility of determining exactly the value of these factors when using an apparatus which developed and delivered to the tube an alternating or peak rectified current. In their paper they recommended as being the only possible manner in which this great difficulty of exact measurement could be overcome, the development of an apparatus capable of delivering to the tube an absolutely constant and unidirectional voltage.

This type of plant was first perfected by Gaiffé, Gallot et Pilon, of Paris, and introduced to the medical profession in July, 1923. It is now installed in all the leading cancer clinics of France, one of the first men to install the new apparatus being Professor Regaud.

In this type of apparatus all the factors are measured by specially devised precision instruments which give an exact determination of voltage, tube current and radiation intensity.

Quite recently Dr. Dauvillier has perfected an X ray dosimeter which measures the value of X ray dosage at the seat of treatment in terms of absolute units, *id est*, ergs per second.

In view of the very keen interest which is being exhibited at the present time in deep therapy X radiation, it is felt that the foregoing information will be appreciated by your readers.

Yours, etc.,

FRANK D. MARSHALL,
B.Sc., M. Inst. P.

143, Castlereagh Street,
Sydney,
October 22, 1925.

University Intelligence.

UNIVERSITY OF SYDNEY.

THE announcement of the appointment of Associate Professor A. N. Burkitt to the Challis Chair of Anatomy at the University of Sydney has been received with universal approval. Professor Burkitt has been on the teaching staff of the University since 1919 when he acted as lecturer and demonstrator of anatomy. In 1924 he was appointed Associate Professor of Anatomy while he was prosecuting researches in Europe. It is stated that the presented appointment has resulted from a strong recommendation of the committee in London, comprising Professor J. T. Wilson, Professor G. Elliot Smith and Pro-

fessor C. J. Martin. There is no question concerning the wisdom of this recommendation, but we would again protest against the untenable principle of permitting a committee in London to determine the appointments to be made in our own universities. THE MEDICAL JOURNAL OF AUSTRALIA joins the medical profession in the Commonwealth in congratulating the new professor on his appointment.

THE TREATMENT OF TUBERCULOUS PATIENTS.

WE have been asked by the Board of Management of the Queen Victoria Homes for Consumptives (New South Wales) to call the attention of medical practitioners to the two sanatoria in the State of New South Wales. The one is situated at Thirlmere and is for female patients, while that for males is at King's Tableland, near Wentworth Falls. Patients seeking admission are required to apply to the Secretary of the Queen Victoria Homes for Consumptives, at the Board of Health of New South Wales, Macquarie Street, Sydney, on Tuesday or Friday at three o'clock in the afternoon. The applicant should bring with him a letter from his medical attendant containing a brief statement of his condition. Medical practitioners are reminded that only patients in the early stages of disease are admitted to these sanatoria. Every patient is examined by one of the honorary medical referees prior to admission. Medical practitioners desiring further information can obtain this from the Secretary either by writing to him at 7, Bligh Street, Sydney, or by telephoning (B 1907).

Obituary.

JAMES McLEOD.

IT is with much regret that we have to announce the death of Dr. James McLeod, of Hurstville, New South Wales, which occurred at Colombo on October 31, 1925.

Books Received.

MODERN OPERATIVE SURGERY: Edited by H. W. Carson, F.R.C.S. (England); Volumes I. and II.; 1925. London: The Waverley Book Company, Limited. Sydney: Angus & Robertson, Limited. Royal 8vo.; Volume I., pp. 784, with 367 illustrations; Volume II., pp. 784, with 374 illustrations. Price: 75s.

Medical Appointments.

Dr. Frank Edgar Wall, M.L.C. (B.M.A.) has been appointed a member of the Railway Superannuation Board, New South Wales.

* * * *

Dr. H. W. Tilling has been appointed Medical Officer of Health for the City of Brisbane. It will be remembered that there has been a great deal of controversy in connexion with the qualifications of the candidates for this new office. Some citizens favoured the appointment of a non-medical officer, on the ground that organizing ability was held to be of greater importance than scientific attainments. That this absurd contention has been relinquished and that a competent medical practitioner has been appointed to a very important position will meet with the approval of the whole of the medical profession. We congratulate Dr. Tilling.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

ADELAIDE HOSPITAL: Honorary Assistant Physician.

PRINCE OF WALES HOSPITAL, RANDWICK: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellow's Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide.	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

Nov. 16.—New South Wales Branch, B.M.A.: Organization and Science Committee.
Nov. 17.—Tasmanian Branch, B.M.A. Council.
Nov. 17.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Nov. 17.—Illawarra Suburbs Medical Association, New South Wales.
Nov. 18.—Tasmanian Branch, B.M.A.: Branch.
Nov. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Nov. 25.—Victorian Branch, B.M.A.: Council; Ballot paper issued.
Nov. 26.—New South Wales Branch, B.M.A.: Branch (Ordinary).
Nov. 26.—South Australian Branch, B.M.A.: Branch.
Nov. 27.—Queensland Branch, B.M.A.: Council.
DEC. 1.—Victorian Branch, B.M.A.: Branch; Ballot paper returned and counted.
DEC. 1.—Tasmanian Branch, B.M.A.: Council.
DEC. 1.—New South Wales Branch, B.M.A.: Ethics Committee.
DEC. 2.—Victorian Branch, B.M.A.: Annual General Meeting.
DEC. 2.—Section of Obstetrics and Gynæcology, New South Wales.
DEC. 3.—Section of Orthopædics, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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